DOCUMENT RESUME

ED 480 195 JC 030 429

AUTHOR	McLeod, Carol B.
TITLE	Epistemological Differences among Community College Students with Varying Reasons for Attendance.
PUB DATE	2002-05-00
NOTE	168p.; Ph.D. Dissertation, University of New Orleans.
PUB TYPE	Dissertations/Theses - Doctoral Dissertations (041) -- Tests/Questionnaires (160)
EDRS PRICE	EDRS Price MF01/PC07 Plus Postage.
DESCRIPTORS	*Age; Beliefs; Cognitive Development; Cognitive Processes; Community Colleges; *Epistemology; *Ethnicity; *Gender Issues; *Learning; Objectives; Opinions; *Two Year College Students; Two Year Colleges

ABSTRACT

Recent research has begun to suggest that epistemological beliefs of students develop to a more sophisticated level with age and education, while other preliminary studies have found that community college students tend to have more naive beliefs about learning and knowledge than do students attending four-year colleges and universities. The purpose of this study was to examine whether epistemological beliefs of community college students vary according to students' reasons for attendance, while controlling for the effects on beliefs of other relevant background and educational characteristics of students. The author used the survey approach, using a questionnaire that featured four dimensions of epistemological beliefs: (1) fixed ability; (2) quick learning; (3) simple knowledge; and (4) certain knowledge. The sample included 531 community college students enrolled in academic, vocational, and technical courses at comprehensive community colleges. Of the returned surveys, 509 of the 531 were used. About 67.7% of sample population were female, 70.53% were white, and 97.45% completed high school or the GED. Approximately 50.69% of respondents had academic majors, while 40.47% had vocational majors. The mean age was 27. Age was the most significant indicator of naive beliefs about fixed ability, with older students being less naive. Gender and GPA are also important indicators. Research instrument is appended. (Contains 11 tables and 89 references.) (NB)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 480 195

EPISTEMOLOGICAL DIFFERENCES AMONG COMMUNITY COLLEGE STUDENTS WITH VARYING REASONS FOR ATTENDANCE

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☞ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

A Dissertation

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

C. B. McLeod

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

Submitted to the Graduate Faculty of the
University of New Orleans
in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy
in
The Department of Educational Leadership, Counseling, and Foundations

IC030429

by

Carol B. McLeod

B.S., The University of South Alabama, 1986
M.H.R., The University of Oklahoma, 1993

May 2002

BEST COPY AVAILABLE

ACKNOWLEDGEMENTS

There are many people to thank as I complete this study. Many of my friends, colleagues, and co-workers have been truly special with their help and support. However, there are some of them who deserve special thanks and these are the people to whom this acknowledgment is written.

To my Nunez Community College family: Thank you, administration and faculty, for allowing me into your classes to survey your students: and thank you, Sydney Ann Dobson, my fabulous assistant, who kept the Human Resources Office going on the many days that I was away from my desk while working on this study.

To my dissertation committee: Dr. David Hollingsworth, Dr. Barbara Johnson, Dr. Jim Killacky, Dr. Mike Paulsen, and Dr. Amy Wells. Your suggestions for improvements and assistance throughout the process were invaluable.

A special thanks to Dr. Mike Paulsen: The third time is definitely the charm, Mike! Your constant support kept me going through some truly discouraging set-backs. This paper would never have happened without you.

Thank you to my father, William Brill, who always knew that I could do it...eventually.

And last on this list but first in my heart, thank you to my husband, Roy. My liberal ideas are not always in sync with your conservative ones, but you supported me, prodded me to finish, and kept me sane while I did—in spite of our differences. Now it's your turn.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS ii

TABLE OF CONTENTS iv

ABSTRACT viii

CHAPTER ONE 1

Introduction 1

Purpose Statement 6

Problem Statement 6

Research Questions 8

Definition of Terms 9

Overview of the Methodology 11

Delimitations and Limitations 13

Significance of the Study 15

Organization of the Study 17

CHAPTER TWO 19

Review of the Literature 19

Introduction 19

The Community College and Its Students 20

The Importance of Epistemological Beliefs in Student Learning and Motivation 25

Background Characteristics 36
Date of Birth/Age 36
Gender 38
Ethnicity 38
Parents' Education 39
Expected GPA 40
How Epistemological Beliefs Have Been Studied and Measured Uni-Dimensionally 43
Multi-Dimensional Theories of Epistemological Beliefs 49
Summary of the Literature and Conceptual Framework for the Study 50
CHAPTER THREE 56
Methodology 56
The Survey Design and Rationale 56
Data Collection 56
Population and Sample 58
Instrumentation 61
Variables in the Study 64
Dependent Variables 64
Independent Variables 65
Reasons for attendance 66
Level of Secondary Education 68
Mother's Level of Education 69
Age/Date of Birth 69

Gender 69
Major programs of study 69
Ethnicity 70
Research Questions 71
Data Analysis 72
Assumptions of the Regression Model 79
Delimitations and Limitations 80
Summary 82
CHAPTER FOUR 83
Findings 83
Descriptive Statistics 83
Multiple Regression Analysis 91
Summary of Findings 104
CHAPTER FIVE 106
Overview 106
Summary of the Findings 109
Discussion on Findings on Epistemological Beliefs 110
Fixed Ability 110
Simple Knowledge 111
Quick Learning 112
Certain Knowledge 112
Discussion on Findings on Reasons for Attendance 113
Factor One: Keep job 113

Factor Two: Employer 114
Factor Three: Find job 114
Factor Four: Credential/Transfer 115
Factor Five: Personal Growth 116
Theoretical Implications 117
Suggestions for Practice for Faculty 122
Suggestions for Further Research 125
Implications for Community Colleges 127
REFERENCES 131
APPENDIX 142
Consent Form 143
KNOWLEDGE AND LEARNING QUESTIONNAIRE 145
REASONS FOR ATTENDING COMMUNITY COLLEGE QUESTIONNAIRE 153
DEMOGRAPHIC INFORMATION 155
VITA 158

ABSTRACT

The study of epistemology and students' views about learning and knowledge has been on going for decades. Earlier research has shown that student sophistication in epistemology usually leads to greater achievement by the student in college. However, initial insights into the epistemological beliefs of students held that students moved from one stage to another stage of epistemological development, growing in one dimension before moving to another. In the 1990's, a new theory of learning and knowledge evolved, one that held that epistemological beliefs could be viewed multi-dimensionally, with students having levels of sophistication in four distinct dimensions of beliefs – fixed ability, certain knowledge, quick learning and simple knowledge–, and that each belief may not necessarily be in sync with the others. This study attempts to move this theory forward by seeking to determine if reasons for attending community college can be used as predictors of students' beliefs in order to help students become successful in their educational endeavors.

Reasons for attending community college that were related to finding employment, keeping employment, or for personal growth were found to be significant predictors of community college students' epistemological belief.

By understanding how students' view learning and knowledge, community colleges can assist their students in achieving success in their educational goals.

CHAPTER ONE

Introduction

Do the epistemological beliefs of community college students differ according to their reasons for attending a community college? Community colleges are often the place where first generation students begin their college careers. They are also the places where adults go to become retrained in different or changing jobs, where the largest percentage of lower-income students attend college, and where credits are earned that contribute to enhanced earnings. Community colleges are the most accessible of all institutions of higher education, supporting a mission, an open-door philosophy, and mixtures of course offerings that allow the student to move between life-long learning opportunities for personal enrichment, vocational training in job-related skills, and academics that lead to associate degrees and transfers to four-year colleges and universities. Even critics of the community college often acknowledge that many persons would not have otherwise attained any higher education if they had not attended community colleges (AACC, 2000; Astin, 1975; Bartel & Lichtenberg, 1987; Beeson & Montgomery, 1993; Blaug, 1985; Dougherty, 1991; Dougherty, 1987; Grubb, 1989; Grubb, 1992; Grubb, 1999;

Jenkins & Fitzgerald, 1998; Kane & Rouse, 1995; Koltai, 1993; Leigh & Gill, 1997; Monk-Turner, 1990; Monk-Turner, 1994; Monk-Turner, 1998; Paulsen, 1998; Sanchez & Laanen, 1998).

However, a major criticism of the community college is that its students very often do not complete a program of study. They begin, they attend for a while, and then they drop out or stop out, often for years at a time. They are less likely than students at four-year colleges and universities to earn certificates or degrees (Bean & Metzner, 1985; Bers, 1984; Cross, 1971; Dougherty, 1987; Ely, 1997; Metzner & Bean, 1987; Mutter, 1992; Nora, Attinasi, & Matonak, 1990; Rentz & Saddlemire, 1988; Richardson, 1988; Schwartz, 1990; Tinto, 1993; Tinto, 1997). In spite of the accuracy of these observations, this criticism is based on the assumption that earning a certificate, earning a degree, or transferring to a four-year college or university should be every community college student's goal. But what if earning a credential or transferring to a four-year college or university isn't the student's goal? What if the student is attending for a different reason? Would the concepts of effectiveness and success for community colleges and their students then become different?

Students in community colleges are more likely than those at four-year colleges and universities to be diverse in terms of many characteristics, such as their age, their ethnicity, the level of their parents' educational attainment, and their likelihood of working while attending college (AACC, 2000). Such diversity among students in the community college population understandably manifests

itself in a diversity of reasons for attending the college as well as in diversity among students in the learning goals they plan to achieve. The student may be attending community college for training or retraining in an employable skill, to transfer to a four-year college or university, to earn a credential, or for personal enrichment through life-long learning. Because of the diversity of reasons, for purposes of the research in the present study, success for the community college student has been defined as the achievement of the learning goal related to the student's reason for attending.

Recent research has indicated that a student's beliefs about the nature of knowledge and learning are very important, but often overlooked, determinants of whether a student achieves his or her learning goals (Comerfordet al.l, 2000; Garland, 1993; Hofer, 1999; Paulsen & Feldman, 1999a, 1999b; Schommer, 1990, 1993). More specifically, studies have shown that students with more sophisticated beliefs often learn more effectively (Hofer, 1999; Schommer, 1990, 1993) and have motivational orientations and use learning strategies that have been shown to promote more effectiveness in the achievement of learning goals (Hofer, 1999; Paulsen & Feldman, 1999a, 1999b; Paulsen & Gentry, 1995; Pintrich, 1989).

Recent research has begun to suggest that epistemological beliefs of students develop to a more sophisticated level with age and education, while other preliminary studies have found that community college students tend to have more naïve beliefs about knowledge and learning than do students

attending four-year colleges and universities (Comerford, Busk, & Roberts, 2000; Schommer, 1993, 1998). Still other studies have found that there are differences in the level of sophistication of beliefs depending on the students' domains or major fields of study (Jehng, Johnson, & Anderson, 1993; Paulsen & Wells, 1998; Schommer, 1993).

As stated above, students have different reasons for attending college and achieving learning goals. By understanding the student's overall reason for attending a community college in the first place, it may be possible to see if the learning goal related to the student's reason for attendance is being successfully addressed in the student's learning experiences. But if students are not achieving their respective learning goals, research suggests that it may be due to differences in the epistemological beliefs of the students or differences between beliefs of students and their teachers. Such differences may cause barriers to student learning, but it may be possible to overcome them once they are recognized and understood.

Research also shows that understanding students' epistemological beliefs is one way that faculty and administrators can help their students achieve their learning goals in their educational experiences. There is evidence to suggest that faculty influence students' epistemological beliefs, whether they are aware of it or not (Beers, 1988). They model their own beliefs, and students, particularly those who are less intellectually mature, tend to believe that persons in authority (such as teachers) transmit absolute truths. Through their interactions with students,

their assignments, and their organization of course content, teachers demonstrate their more sophisticated assumptions about learning and knowledge. Students begin to develop and advance beyond their own less naïve beliefs as they mature intellectually and by observing the implicit and explicit beliefs of their teachers (Beers, 1988).

Therefore, in studying students' reasons for attending the community college -- and the learning goals they wish to achieve -- research also needs to address concerns about students' beliefs about learning and knowledge. The community college has a multifarious mission -- e.g. academic, vocational, job skill development, personal enrichment -- and its students are highly diverse in their reasons for attendance and learning goals. Therefore, the preliminary findings that the epistemological beliefs of community college students may be less sophisticated than those of four-year college students (e.g. Schommer, 1993), and that beliefs differ across diverse fields of study (e.g. Jehng, Johnson, & Anderson, 1993; Paulsen & Wells, 1998), clearly intensify the need for more research on the epistemological beliefs of community college students, especially as they are related to students' reasons for attendance and achievement of their learning goals.

Unfortunately, very little research has been conducted to examine the epistemological beliefs of community college students (e.g. Schommer, 1993) or to identify and study the variety of reasons for attendance -- and the corresponding variety of learning goals to be achieved -- among such students.

Furthermore, there have been virtually no systematic investigations of the possible relationships between the reasons for attendance and the epistemological beliefs of community college students. Therefore, the present study seeks to study the nature of epistemological beliefs and the reasons for attendance among community college students, and seeks to answer the following question: Do the epistemological beliefs of community college students differ according to their reasons for attending a community college?

Purpose Statement

The purpose of this survey study was to examine whether the epistemological beliefs of community college students -- that is their beliefs about the nature of knowledge and learning -- vary according to students' reasons for attendance while controlling for the effects on beliefs of other relevant background and educational characteristics of students.

Problem Statement

For many years, critics of the community college have asserted that community college students do not finish programs. Their claims are accurate in that the average community college student who does finish takes over five years to complete a "two-year" degree, and many never finish all of the required course work for a credential. The lack of an earned credential has been used to support the argument that community college students do not persist and that attending the community college does not elevate the student to a higher socioeconomic

status. In other words, community colleges doom their students to a failure to succeed (AACC, 2000; Dougherty, 1991; Grubb, 1989; Grubb, 1992; Monk-Turner, 1998; Rentz & Saddlemire, 1984).

However, other evidence suggests that the earning of a credential may not be as critical as completion of credits when it comes to earnings over a lifetime. In many instances, students attend community colleges in order to earn credits and acquire skills, but not necessarily to earn a degree or certificate. Once the student's desired skill level or competency is reached, the student leaves (Bartel & Lichtenberg, 1987; Bartlett, 1978; Beeson & Montgomery, 1993; Freeman, 1975; Grubb, 1989; Grubb, 1995; Grubb, 1999; Jenkins & Fitzgerald, 1998; Kane & Rouse, 1995; Leigh & Gill, 1997; Paulsen, 1998; Sanchez & Laanen, 1998). Therefore, it is time to begin a new inquiry into the reasons why students attend community colleges and look beyond persistence towards a credential for different and more appropriate measures of success and effectiveness for community colleges and their students.

Part of the purpose of this study was to determine what the students' own reasons for attendance really are. The results indicated that students' reasons for attendance are more consistent with the multifarious mission of the community college than with the more narrow earn-a-degree-or-certificate assessment expressed previously by some analysts (Dougherty, 1987; Grubb, 1989, 1995, 1999; Monk-Turner, 1998). Another major aspect of this research was to examine the beliefs about the nature of knowledge and learning that students

bring to the community college classroom. Research has consistently shown that the more sophisticated the student's beliefs are, the better his/her academic performance is (Hofer, 1999; Schommer, 1990, 1993). By understanding the community college students' beliefs about knowledge and learning, the community college should be better able to assist students in their learning, whatever the courses may be and for whatever reason the students are attending.

Given a wide variety of reasons for attending a community college, there is the possibility that particular reasons for attendance may be related to different levels of sophistication in epistemological beliefs. If this relationship exists, then an enhanced understanding by the faculty of the students' reasons for attendance may serve to highlight differences in epistemological beliefs, and faculty can then help students develop or advance to a more sophisticated level. Helping the student develop a higher level of sophistication in beliefs about knowledge and learning will help the student be more successful in pursuit of their learning goals.

Research Questions

There are multiple possibilities regarding students' reasons for attending a community college. Students may attend a community college to brush up on skills already learned; they may be attending for recreational purposes. Some, though not a majority of them, attend community college as their starting place in seeking a four-year degree (AACC, 2000). It is possible that some students may

not even be aware of their ultimate reason for attending. The community college, by its very nature, allows for experimentation and discovery in higher education without the same commitment of time and money that a four-year college or university requires (U. S. Department of Education, 2001). Students may not be as accurate in describing personal or subjective reasons for attending, often because they are not fully aware of these reasons themselves. Therefore, for purposes of this study, we will look at only those reasons that the students can easily articulate with accuracy, when asking the following research questions.

1. What are the student's epistemological beliefs?
2. What are the student's reasons for attending a community college?
3. Do these beliefs about knowledge and learning differ according to reasons for attendance?
4. Do these beliefs about knowledge and learning differ according to selected background characteristics?

Definition of Terms

Before any study can be conducted regarding a student's epistemological beliefs, a set of definitions regarding those beliefs is essential. Hofer and Pintrich's (1997) definition of epistemological beliefs is that they are relatively unexamined assumptions that focus on students' reasoning and justification for their thinking about knowledge and learning. Since this study will use Schommer's Epistemological Questionnaire, the definitions of the four dimensions of epistemological beliefs are Schommer's (1993, 1998).

Four dimensions of epistemological beliefs are identified using Schommer's questionnaire. The definition of each dimension is expressed in terms of its most naive form. The four dimensions are: fixed ability, which is the belief that the ability to learn is determined at birth and can be subsequently improved; quick learning, which is the belief that learning occurs in a short amount of time or not at all; simple knowledge, which is the belief that knowledge is a series of isolated facts; and certain knowledge, which is the belief that knowledge is unchanging.

A comprehensive community college is an institution in which the student may pursue an associate degree in an academic or applied field, take courses with the objective of transferring to a four-year college or university at a later date, obtain a vocational or technical certificate, receive training or retraining in an employable skill, and/or continue life-long learning pursuits for personal or professional enrichment by taking one or several courses which do not necessarily lead to a certificate or degree (AACC, 2000).

The community college student is often a non-traditional student, who is over 24 years old, employed, married, non-residential, and attends college on a part-time basis (AACC, 2000; Koltai, 1993; Rentz & Saddlemire, 1988).

For purposes of this paper, the community college student is successful if he or she achieves a learning goal that is related to his or her reason for attendance.

Overview of the Methodology

This research consisted of a survey of community college students attending a community college in the southeastern part of the country. The students surveyed were those majoring in both academic and vocational-technical fields. The survey included Schommer's Epistemological Questionnaire, as well as sections designed to collect data on demographic and background characteristics of students. A survey approach was preferred in this study because it allowed for a rapid turn-around in data collection. It also allowed the researcher to identify attributes of a population from the smaller sample. The sample used reflects the background characteristics of the nation's community colleges.

In 1999, there were 1600 public and private two-year community colleges in the United States, up from eight in 1900. The summary profile (Fall 1998) of national student demographics is compared below with current statistics of the local community college site chosen for this study (Nunez Community College, Fall 2001).

Table 1

Demographic Comparison Of National Community College Profile With Current Nunez Community College Profile

		All Community Colleges	Nunez Community College
Enrollment Status:	Part-time students	63.3%	45.5%
	Full-time students	36.7%	54.5%
Gender:	Female Students	57.9%	68.8%
	Male Students	42.1%	31.2%
Ethnicity:	Non-White Students	30.0%	29.1%
	Black	11.1%	22.7%
	Native American	1.3%	1.8%
	Asian American	5.8%	1.6%
	Hispanic	11.8%	3.1%
	Resident Alien	3.8%	0.0%
	Unknown	1.9%	1.8%
	White Students	64.8%	69.0%
Age Groupings:	Under 18 years old	3.9%	2.9%
	18 to 19	20.0%	16.5%
	20 to 21	15.6%	16.0%

Table 1 con't

22 to 24	13.1%	14.7%
25 to 29	13.8%	14.7%
30 to 34	9.4%	11.8%
35 to 39	8.0%	7.5%
40 to 49	10.4%	11.1%
50 to 64	3.9%	4.2%
65 or older	1.1%	0.5%
Age Unknown	0.8%	0.0%

The survey approach was also consistent with the causal-comparative nature of the present study, which examined the extent to which students' reasons for attending college, and selected background characteristics of students, were related to their epistemological beliefs.

The survey was administered to the respondents by the researcher personally. On the survey, students were asked for additional information regarding background characteristics, such as completion of high school, age, gender, ethnicity, parental education, and reasons for attending the community college.

Delimitations and Limitations

This study was delimited to surveying students enrolled at a local

community college. Students enrolled in courses in both the academic disciplines and the vocational disciplines were surveyed about their epistemological beliefs using Schommer's Epistemological Questionnaire. This convenience sample was obtained by asking faculty members for access to one or more of their class periods in order to administer the survey. The local community college studied has a population demographic similar to the national picture of the average community college student, so the results of this study should be generalizable to the experiences of students at community colleges with similar demographic profiles.

It was anticipated that students' ratings for some of the reasons for attending college listed on the survey might be influenced, at least in part, by the unique conditions of the local economy at the time of the survey. It is well established in the literature, that college enrollment decisions reflect the nature of economic conditions, often with increased enrollment during times of economic hardship (Paulsen, 1990). During times of economic prosperity, students' reasons for attending college will tend to differ from reasons for attending during times of economic down-turns. However, even though rates of unemployment may have affected the results of this survey, the same would be true of any survey administered to any group of students at any community or other type of college. And more importantly, there is no reason to suspect that correlation between economic conditions and students' ratings of reasons for attendance would, in any way, affect the nature of the hypothesized relationship between

reasons for attendance and epistemological beliefs of community college students in this study.

Some demographic and background characteristics of students appeared to change depending upon the time of day the students were enrolled in classes. For example, the majority of employed students seemed to take classes in the evenings, while the students who took classes during the day were often unemployed or under-employed. In addition, many of the courses from the technical programs at the community college that were included in the sample were offered only during the day. Therefore, the researcher made every effort to include a variety of day, evening, and weekend classes in the study.

Finally, considerable effort was dedicated to the generation of a comprehensive list of potential reasons for student attendance at community colleges. Nevertheless, in spite of the recommendations of the panelists and the students in two separate focus group interviews, one possible limitation of the study is that the list of reasons identified and included on the survey may not include all possible reasons for attendance.

Significance of the Study

Many studies have been done in the past two decades to assist college and university educators in finding ways to help their students achieve their learning goals. However, only a small portion of this work has been done with community college students, and no research has been found that addresses the relationship between the epistemological beliefs of community college students

and the reasons such students are attending the community college. Since the majority of first-generation college students, the majority of minority students, and nearly 50 percent of lower-income students begin their college careers at community colleges, gaining an understanding of the students' beliefs about the nature of learning and knowledge and their reasons for choosing to attend a community college can help the college to deliver its services and courses in ways that will help students to achieve their learning goals. Additionally, determining the reasons for attendance may form the basis for a new way of conceptualizing and examining the success of community colleges and their students, instead of continuing to view and examine rates of program completion by the students as the only valued measure of success.

The results of this study might also provide insights into the apparent contradiction between the views of instructors in the vocational and technical areas that their students may be more naïve about knowledge and recent research indicating that adult learners tend to have more sophisticated beliefs about the nature of knowledge and learning (Schommer, 1998). Finding ways to assist faculty in understanding their students' epistemological beliefs may help them organize content, prepare syllabi, interact with students, and evaluate student work so that students begin to develop more mature and effective epistemological beliefs. In addition, whether or not faculty members are aware of it, they model their own epistemological beliefs in the ways they interact with students, and this interaction can be quite profound. Faculty can potentially

shape students' epistemological beliefs and affect changes in the way the students view their own learning (Beers, 1988). Gaining an understanding of the way their students view knowledge and learning can help community college faculty in deciding how to work with their students. Such understanding can assist faculty in helping students become successful in the achievement of their learning goals related to their reasons for attending the community college. Using this understanding to develop effective teaching strategies for students with different beliefs about learning and knowledge should result in increased success in educational experiences for the community college student.

Organization of the Study

This study examined the beliefs about the nature of knowledge and learning that community college students bring to their educational experiences and if these beliefs differ according to students' reasons for attending community college. The population studied was that of students in academic, vocational, and technical courses at community colleges. Since community college students attend for a variety of reasons, such as obtaining a degree, personal and professional enrichment, and to enhance employable skills, it is important to understand how beliefs may differ according to reasons for attendance. Faculty and staff should find it helpful in assisting their students by understanding how the students believe knowledge and learning occurs in the classroom. Chapter II reviews the current literature on epistemological beliefs of the college student and how they are related to various student characteristics, and presents the

conceptual framework for the study. Chapter III presents the methodology for the study and Chapter IV reports on the findings of the study. Chapter V summarizes of the study and includes implications for theory, policy, and practice, as well as for further research in this important, and neglected, area of study.

CHAPTER TWO

Review of the Literature

Introduction

The study of the epistemological beliefs of college students is not new. Since the 1960's researchers have been exploring ways to find out how students view knowledge and learning and how their perceptions contribute to their approach to learning. However, little of this research in the past four decades has been conducted with community college students and no research has examined the relationship between students' epistemological beliefs and their reasons for attending a community college. In order to help the reader better understand this study and its significance, this review of the literature is organized in the following manner. First the review gives a brief description of the community college, its mission and role, and the community college student; next the review addresses the importance of epistemological beliefs for student achievement of learning goals, the motivation to learn, and the use of effective learning strategies. Section three addresses how background factors influence the development of epistemological beliefs. Section four discusses the ways in which research about epistemological beliefs has been developed and studied and discusses Schommer's development of the theory of four dimensions of epistemological

beliefs. The review concludes with the conceptual framework for the study.

The Community College and Its Students

In 2001, the community college celebrated its 100th anniversary as a uniquely American institution (AACC, 2001). In its 100 years, the community college has evolved into a comprehensive institution of post-secondary education that seeks to serve the diverse needs of its immediate community. The philosophy of the community college mission is to have a community college within fifty miles of every student in the United States.

In many ways, the community college is the most democratic of all post-secondary educational institutions, with its open-door admissions policies, remedial classes for the under-prepared high school graduate or high school non-completers, and its offering of courses in academic, vocational, and technical disciplines, as well as opportunities for life-long learning experiences. For many community college students, the opportunity to attend college at all begins and ends with the community college.

The community college population has a demographic profile that is decidedly different from that of the population of a four-year college or university. This population is likely to be older, to have fewer educational experiences, to be a member of a minority group, to be working while attending college, to have fewer family members educated beyond high school, and to be from a lower socioeconomic background than the average four-year college or university student (AACC, 2000; Dougherty, 1991; Grubb, 1989; Grubb, 1992; Monk-

Turner, 1998).

The needs of the community often dictate the course offerings at the local community college. A major part of the national mission of the community college is to meet the needs of local business and industry, as well as provide academic and educational enhancement of its students. Because of its role in helping the local community have an educated and employable workforce, it is important that the community college find ways to help its students achieve their learning goals. A recent survey by the American Association of Community Colleges (2000) revealed that employers preferred to use community colleges as service and training providers for their employees because of the diversity of programs in technical and skills areas, the costs associated with the training, and the community college's proximity to the workplace.

Because a major part of the mission of the community college is to provide opportunities for professional growth and employment, the U.S. Department of Labor is also using community colleges as training providers under the Workforce Investment Act and welfare reform programs (Friedman, 1999; Harris, 1996; Nightingale, Trutko & Barnow, 1999). With the emphasis in these programs on short-term training opportunities, the scope of the mission of community colleges has been responsive and changed to reflect those needs. This means that even more than before, the community college has begun to realize that program completion and transfer may not be the learning goals of every student. The community college must concentrate its efforts on assuring that students

achieve learning goals which may or may not include program completion.

However, for many years, critics of the community college have asserted that because so many community college students do not finish programs or earn credentials, community colleges are less effective and their students are less successful than their four-year counterparts. In brief, this view suggests that community colleges lead their students to failure instead of success (AACC, 2000; Dougherty, 1991; Grubb, 1989; Grubb, 1992; Monk-Turner, 1998; Rentz & Saddlemire, 1984). Clearly, such criticisms overlook the multifarious mission of the community college and the value of the opportunities it provides for short-term training, personal enrichment, and exploration of interests and careers -- that is, opportunities for the pursuit of learning goals that do not necessarily depend on the earning a credential.

As noted above, students attend community colleges for many different reasons -- each corresponding to a unique learning goal. Because of the comprehensive and multidimensional nature of the mission of the modern community college, a more meaningful conceptualization of success for the community college student is clearly needed. Therefore, for purposes of the research in the present study, success for the community college student will be defined as the achievement of the learning goal related to the student's reason for attending.

Studies have consistently indicated that more sophisticated epistemological beliefs among students promote the achievement of learning

goals (Comerford, et al., 2000; Garland, 1993; Hofer, 1999; Paulsen & Feldman, 1999a, 1999b; Schommer, 1990, 1993). Therefore, finding ways to identify and understand the epistemological beliefs of its students is one way the community college can help its students meet their learning goals. Indeed, if community colleges reconceptualize their measurement of success as the completion of a learning goal related to the reason for attendance, then helping their students achieve a more sophisticated level of epistemological beliefs by reducing barriers to more sophisticated beliefs about knowledge and learning would assist the community college student in meeting his/her learning goal.

The community college student is, on average, over twenty-five, employed or under-employed, and may be attending college for a variety of reasons, including retraining in a job, upgrading skills, learning entirely new skills, or searching for educational enrichment. Under these circumstances, it is particularly important to understand how community college students' beliefs about the nature of knowledge and learning might differ according to differences in students' reasons for attending a community college (Bauer, Mitchell, & Bauer, 1991; Garland, 1993; Schommer, 1990; Schommer & Walker, 1997). Some studies suggest that community college students have less sophisticated beliefs about learning, while others suggest that a student's beliefs become less naïve with age, work experience, and increased educational opportunities (Baxter-Magolda, 1992; Jehng, 1993; Packer & Goicoechea, 2000; Rossiter, 1999; Schommer, 1993; Schommer, 1998; Comerford, Busk, & Roberts, 2000).

However, community college students, on average, bring both greater workplace experience and greater age to the classroom than do students at four-year colleges and universities.

Some initial research has found that there may be important differences between community college students and students attending four-year colleges or universities in terms of their beliefs about the nature of knowledge and learning. More specifically, both Schommer (1993) and Comerford, et al (2000) have found that community college and four-year college and university students differ on all epistemological dimensions. Some of these differences can likely be attributed to the differences in the parents' educational background, to the fact that community college students have greater barriers to access to higher education, and to family responsibilities in general, which are greater for the community college students than they are for the typical student at a four-year college or university (Bean & Metzner, 1985; Bers, 1984; Cross, 1971; Dougherty, 1987; Ely, 1997; Metzner & Bean, 1987; Mutter, 1992; Nora, Attinasi, & Matonak, 1990; Rentz & Saddlemire, 1988; Richardson, 1988; Schwartz, 1990; Tinto, 1993; Tinto, 1997). However, it is also probable that at least some of these differences in epistemological beliefs can be explained by the diverse reasons that students choose community colleges over four-year colleges and universities.

Because the community college offers so many different kinds of courses and opportunities for exploration and discovery, students attend community

colleges for many different reasons. Evidence exists that community college students are more naïve in terms of their epistemological beliefs than students at four-year colleges and universities who enter those postsecondary institutions directly from high school (Comerford et al., 2000; Schommer, 1993) and a criticism of the community college is that students often do not complete programs, degrees or certificates (Bean & Metzner, 1985; Bers, 1984; Cross, 1971; Dougherty, 1987; Ely, 1997; Metzner & Bean, 1987; Mutter, 1992; Nora, Attinasi, & Matonak, 1990; Rentz & Saddlemire, 1988; Richardson, 1988; Schwartz, 1990; Tinto, 1993; Tinto, 1997). A link may exist between non-completion of learning goals and epistemic naïveté that could be a possible additional barrier to post-secondary education for the community college student. For the adult learner, as many community college students are, many problems with persistence towards the learning goal at the community college may very well be based on problems related to learning styles and epistemological barriers (Garland, 1993). "The student's epistemological stance is a screen through which new knowledge must be acquired. This screen can become a barrier when the epistemological stance of a course's content or expectations is incompatible. The student's conceptual framework cannot easily accommodate it" (p. 192). Research has provided insight into the ways in which this screen can influence students' learning and motivation.

The Importance of Epistemological Beliefs in Student Learning and Motivation

Students learn better when the process of learning matches their ways of

knowing and their beliefs about learning and knowledge (Baxter Magolda, 1992; Beers, 1988). Evidence also suggests that students' epistemological beliefs are related to their motivation to learn and their use of learning strategies (Comerford et al., 2000; Paulsen & Feldman, 1999a, 1999b; Stodolsky, Salk, & Glaessner, 1991), to their motivation to stay in college and value their educational experiences, (Bauer et al., 1991; Beers, 1988; Garland, 1993; Schommer & Walker, 1997) and to their level of education and field of study (Alexander & Judy, 1988; Enman & Lupart, 2000; Jehng, Johnson & Anderson, 1993; Kahn, 2000; Paulsen & Wells, 1998; Schommer, 1993).

Baxter Magolda (1992), through a series of interviews in a longitudinal study of four years, explored students' perceptions of their academic experiences. From eighty sets of four-year interviews, she discovered three different epistemological levels, or what she calls, "ways of knowing" (p. 268). These three ways of knowing are absolute knowing, where the knower's core assumption is that knowledge is certain; transitional knowing, where the knower's core assumption is that knowledge may be partially certain and partially uncertain; and independent knowing, where the knower's core assumption is that knowledge is uncertain. She selected first-year, traditionally-aged students from a four-year public university as her participants.

An absolute knower defines learning as obtaining knowledge from the instructor. The nature of knowledge for the absolute knower is that it is certain. An absolute knower either receives knowledge passively, through listening and

taking notes, or more actively, by participating in class and proving interest to the teacher through mastery of the material. The absolute knowers in this study appreciated caring, dedicated teachers who had interesting classroom lectures, demonstrations, and who provoked little or no contradictory views in the classroom. For the absolute knower, appropriate evaluation of learning was objective exams and tests on which the students returned the instructor's ideas.

The transitional knower believes that knowledge is partially certain and partially uncertain. Therefore, a transitional knower defines knowledge as understanding, rather than simply receiving, the material. Transitional knowers approach learning in one of two ways; they may be interpersonal knowers, where they share information, collect each other's ideas, and relate their own ideas to personal experience, or they may be impersonal knowers, and involve themselves in challenging debates with classmates and use research and logic to resolve uncertainty. The transitional knowers in this study preferred evaluations that measured their understanding of the material, rather than exams which did little more than ask for recollection of the instructor's ideas. Transitional knowers learned best in classes where the teachers interacted both in and out of the classroom with the students, and encouraged student involvement in their own learning. Transitional knowers wanted and needed feedback from their teachers, and encouragement to understand, think, and apply the class material.

The independent knowers' core epistemic belief is that knowledge is uncertain. They begin to generate their own viewpoints, which they share with

others, and they have reached a point in their development where they are open to others' viewpoints without the need to challenge those views. Faculty-student interaction is crucial to learning for the independent knower. Active involvement with peers and instructors are how the independent knower learns. Being able to express their own opinions and being able to hear others' opinions helped the independent knowers to assess whether or not they had gained in knowledge. Appropriate evaluation for the independent knower includes opportunities to express themselves as knowers.

In the interviews over the four-year period, Baxter Magolda found that when the instructors' teaching matched the students' beliefs about knowledge, students learned more effectively. Teachers of absolute, transitional, and independent knowers who can connect with the students' epistemology and use teaching strategies that support the knowers' beliefs while encouraging epistemic growth tended to have students who felt that they learned better.

Beers (1988) approached the same idea that student learning is connected to the way teachers model their beliefs in the way they teach. She interviewed college teachers at a liberal arts college in order to understand teachers' goals. What she found was that when teachers talked about educational goals, what they really were talking about were the epistemological assumptions held by the teachers and modeled in their classrooms. Her work suggests that college teachers often do not realize that students' academic difficulties may arise from failure on the teacher's part to understand the students'

views of knowledge, and that often students think that they have appropriately performed when, in the teacher's view, they have inadequately performed.

Teachers embody and model their own epistemological beliefs. Their grading opportunities, syllabi, arrangement of course content and interactions with students demonstrate the teacher's epistemic view, whether or not they are aware of it. "To the extent that a teacher's grading reflects his or her view of knowledge, students who adopt that view will be at an advantage" (p. 89). However, what happens to the students who don't or can't adopt that view?

Because few college teachers have explicit training in teaching techniques or styles, they may not recognize that there is an epistemic disconnection happening in their classrooms between themselves and their students. One purpose of this proposed study is to encourage faculty to find ways to discover what their students think about knowledge and learning. In other words, if faculty can determine what the beliefs of their students are, they may be able to help them achieve their learning goals better by matching teaching to epistemological beliefs as much as possible, and by encouraging growth in those beliefs by modeling a higher level of them. Some research has shown that students' perceptions of subject matter change with exposure to different kinds of instruction in the subject (Stodolsky et al., 1991) and using a variety of teaching strategies to encourage development of different kinds of knowing and learning would be beneficial for students.

Another reason to encourage epistemological growth in community

college students is because research supports the idea that students with less naïve beliefs have a higher motivation to learn and are more likely to engage in cognitive, metacognitive, and other self-regulated learning strategies that are particularly effective in achieving learning goals (Paulsen & Feldman, 1999a, 1999b). Using Schommer's (1990) Epistemological Questionnaire and the Motivated Strategies for Learning Questionnaire (MSLQ) designed by Pintrich et al. (1991), Paulsen and Feldman (1999b) studied how the four dimensions of epistemological beliefs are related to six different motivational constructs. In this study, they discovered that three of the four dimensions of students' epistemological beliefs were significantly related to four or more of the six motivational constructs. Students with naïve beliefs about the structure of knowledge, students with naïve beliefs that learning was quick or not all, and students with naïve beliefs that the ability to learn is fixed were less likely to have an intrinsic goal orientation, to appreciate the value of learning tasks, and to perceive an internal control over learning. They were also more likely to have higher levels of test anxiety, were more likely to have an extrinsic goal orientation, and were less likely to feel that they had sufficient control over their capacity to learn. Students with more sophisticated beliefs in these three dimensions – simple knowledge, quick learning, and fixed ability – were more likely to believe that the ability to learn can improve over time.

In another study, Paulsen and Feldman (1999a) examined relationships between students' beliefs about knowledge of learning on Schommer's four

dimensions of epistemological beliefs and a set of measures of students' use of cognitive, metacognitive, and volitional-control learning strategies, again using Schommer's Epistemological Questionnaire and the MSLQ by Pintrichet al. They sought to determine whether or not students with more sophisticated beliefs engaged in deeper processing strategies, metacognitve strategies, and resource management strategies than students with more naïve beliefs. They found significant relationships between three dimensions of epistemological beliefs and as many as eight of the skill components of self-regulated learning.

Students with naïve beliefs in simple knowledge were more likely to use rehearsal strategies; students with naïve beliefs in fixed ability and simple knowledge were less likely to use deeper-level organization strategies. Students with naïve beliefs in fixed ability, quick learning, and simple knowledge were less likely to use deeper-level processing strategies. Students with naïve beliefs in fixed ability and simple knowledge were less likely to engage in effective effort-regulation strategies. Students with more sophisticated beliefs in fixed ability, quick learning, and simple knowledge were more likely to engage in effective strategies of metacognition. Generally speaking, their findings indicated that students with more sophisticated epistemological beliefs were more likely to use effective self-regulated learning strategies than were those with more naïve beliefs.

Other research has shown a relationship between students' epistemological beliefs and their major courses of study (Enman & Lupart, 2000;

Jehng et al., 1993; Kahn, 2000; Paulsen & Wells, 1998; Schommer & Walker, 1995; Stodolsky et al., 1991). "Epistemological positions also may vary more or less systematically by discipline " (Beers, p. 91, 1988). The present study will examine whether or not students' epistemological beliefs are related to their reasons for attending a community college – and their achievement of their learning goals at the college. It seems likely that course offerings at the community college are related to the reasons students attend. Therefore, the findings of the above studies that students' epistemological beliefs vary according to their major fields of study would appear to suggest that students beliefs and reasons for attending may also be related.

In Enman and Lupart's (2000) study of science majors, they used both Eccles' Model of Achievement Motivation (1987) and Schommer's Epistemological Questionnaire (1990) to determine if individuals who major in science differ from those who do not in epistemological beliefs and motivational constructs. They found that those who majored in sciences had a stronger belief in fixed ability than did those who chose a non-science major. Science majors also had a stronger belief in the simplicity of knowledge. The study suggests that once students commit to a science major, less emphasis is placed on the ability to learn and more emphasis is placed on acquiring knowledge in the domain.

Jehng et al. (1993) sought to discover if students who specialize in different disciplines possess different beliefs about learning. They used Schommer's (1990) framework, but replaced the dimension of "simple

knowledge" with "orderly process" so that their list of factors to be studied was:

1. Certainty of knowledge: knowledge is more likely to be certain and unchanging than tentative and unpredictable;
2. Omniscient authority: knowledge is handed down by teachers and other experts rather than formed by independent reasoning;
3. Orderly process: the learning process tends to be regular rather than irregular;
4. Innate ability: the ability to learn is innate rather than acquired; and
5. Quick learning: learning is an immediate rather than a slow process of accumulating knowledge.

Using a sample of 1000 students in five educational levels (freshman through graduate student) within four fields (engineering, business, social science, and arts and humanities), the study surveyed the students using Schommer's Epistemological Questionnaire. The researchers got back 486 completed surveys. In the analysis, they found that students' epistemological beliefs evolve as they are exposed to more education, and that students with more education in a domain tend to believe that the nature of knowledge is uncertain, learning is not a totally orderly process, and independent learning is crucial. However, students' epistemological beliefs about innate ability and quick learning were not affected by the amount of education that they have had.

Paulsen and Wells (1998) asked if the epistemological beliefs of college students differ between major fields in a survey study of 290 students. All 290

students had declared a major in one of the following six domains: humanities and fine arts, social sciences, natural sciences, education, business, and engineering.

Using Schommer's Epistemological Questionnaire to assess students' beliefs and Biglan's taxonomy of domains of study to classify the participants' fields of study into hard, soft, pure, and applied dimensions, Paulsen and Wells examined whether students' beliefs varied according to domain. They looked for differences in beliefs along the hard-soft and pure-applied dimensions and whether any effects of domain differences between pure and applied or hard and soft fields of study persisted after controlling for background factors.

They found differences in epistemological beliefs across the six domains and that three of the four dimensions were significantly different across domains. Those three dimensions were simple knowledge, quick learning, and certain knowledge. Beliefs in fixed ability did not vary by domain. Students with majors in the pure fields, as defined by Biglan, were less likely to hold naïve beliefs about simple knowledge, quick learning, and certain knowledge than were students with majors in applied fields. Students with majors in soft fields were less likely to hold more naïve beliefs in certain knowledge than were students who majored in hard fields; and students' beliefs varied according to different background and demographic factors such as age, gender, and grade-point average.

Schommer and Walker (1995) similarly questioned if students' beliefs were

domain independent or dependent. However, their study did not concentrate on the students' beliefs within major fields of study, but rather on the same students' beliefs about two different domains, math and social sciences. Working on the assumption that epistemological beliefs are independent of domains, they asked a group of 114 students to complete the Epistemological Questionnaire twice, once while thinking about social sciences and once while thinking about mathematics. In between the two assessments, the participants were asked to read a passage in either social sciences or math and then to take a mastery test. They were hoping to find if students' beliefs in social sciences and mathematics were similar or dissimilar.

Contrary to Paulsen and Wells' findings, Schommer and Walker found that epistemological beliefs were moderately similar across domains. The majority of the students in the study displayed consistent levels of sophistication whether they were considering social sciences or mathematics as they completed the survey.

Kahn (2000) also asked if there was a relationship between students' epistemological beliefs and major fields of study. She found a number of significant differences in beliefs across major fields of study in her survey study of 833 students. For example, she found that undergraduates and graduate students with majors in natural and math sciences held more naïve beliefs when compared to other majors in all four dimensions of epistemological beliefs. Education majors were more likely to hold naïve beliefs in all four dimensions in

comparison to students in other domains. Students majoring in business administration and students in engineering held less naïve beliefs across all dimensions, except certain knowledge, than did students majoring in fine arts/humanities.

Students with more mature epistemological beliefs have been found to achieve success in their educational endeavors; they have different kinds of learning strategies that may be connected to the level of sophistication of their beliefs. If community colleges can find a way to discover what levels of sophistication of beliefs their students have, it may be possible to help the student develop or mature their learning strategies so that they can reach their learning goals successfully. Using previous research about students' beliefs and domains of study is one way in which community colleges can help students reach those learning goals.

However, in all research about epistemological beliefs, it is necessary to also consider the importance of background factors. Information on variables such as age, gender, ethnicity, programs of study, grade point average, parental education, level of secondary education, and reasons for attending community college can help explain how epistemological beliefs were formed.

Background Characteristics

Date of Birth/Age

Age has been found to be significantly related to epistemological beliefs in

several studies (Kahn, 2000; Paulsen & Wells, 1998; Schommer, 1993, 1998) and can be expected to be a factor in the present study as well. Paulsen and Wells, in their study about differences in beliefs across domains of study, included age as a factor in the development of the students' beliefs. They classified participants as either of traditional college age (17-24 years old) or non-traditional college age (25 years old or older). Their finding was that students of non-traditional age were less likely to have naïve beliefs in fixed ability than were traditionally aged students.

Schommer (1993, 1998) also found that age has unique effects on the development of epistemological beliefs in adults. As people grow older, they are more likely to believe that learning can be improved and that the ability to learn is not fixed at birth.

Kahn (2000), however, found contradictions to both of these studies in her research. She observed that older undergraduate students held more naïve beliefs in fixed ability and simple knowledge. However, she theorized that her sample may not have been of an adequate range of ages among the undergraduate students in her sample, because other findings have shown consistently that the more mature student usually holds less naïve beliefs in fixed ability.

In addition to age, it is also important to look at other background factors, such as gender.

Gender

The ways in which men and women view learning and knowledge has been the subject of numerous studies over the years. Belenky et al. (1986) and Baxter Magolda (1992) both found that, on average, women learn and view knowledge differently from the way men learn and view knowledge. As interest in the development of epistemological beliefs has grown, other researchers have used gender as background variable to study as a factor that may influence the beliefs of learners.

Schommer (1993) found in her study of junior college and university students in social science and engineering majors that females were less likely to believe in quick learning. Paulsen and Wells (1998) found in their study of epistemological differences across domains that women appeared to hold more sophisticated beliefs about the nature of learning, while men held more sophisticated beliefs about the nature of knowledge. Since the national majority of community college students are female, this will be an important variable to include in the present study.

Other background factors, such as ethnicity, are also potentially important in the study of epistemological beliefs.

Ethnicity

Few studies on epistemological beliefs have used ethnicity as a background factor to examine, though there have been some limited studies about learning and culture in general. Baxter Magolda (1992) found that there a

few limited exceptions to her "ways of knowing" in feminist, black, and Native American scholarship. In many shared function cultures, ways of learning and knowing are viewed differently from the way that they are viewed in other cultures. Learning and knowing tend to be passive rather than active in some shared function cultures. Because it has been virtually ignored in the literature, this factor will be included in the present study to determine if beliefs vary with ethnicity.

Parents' Education

Schommer's (1993) study asked specific questions about upbringing characteristics, including items about the level of the students' parents' education. In this study, she compared the epistemological beliefs of junior college students and university students and found significant differences across all four dimensions of beliefs. However, when she factored in parental education, she found that whatever differences there were between students in junior college and the university in beliefs about simple knowledge and quick learning were eliminated. For both groups, the more educated the parents were, the less likely the students were to have naïve beliefs in simple knowledge and quick learning.

Because community college students are very often first-generation college students, it will be interesting to determine if parental education is as significant for the community college student when students' reasons for attending are added into the mix of variables in the model.

Expected GPA

In Paulsen and Wells' (1998) study, students with higher GPA's were less likely to believe in simple knowledge than those with lower GPA's. Some students surveyed in the present study won't have a grade point average at the time of the survey, so all were asked to predict what their GPA will be at the end of the semester. The survey was administered at or around mid-term at the community college, so students had at least one grading opportunity and should have been able to make a best guess based upon the grades already received in the class.

Reasons for Attending Community College

Little or no research has been done up to now to determine if community college students' epistemological beliefs are related to their reasons for attending a community college, as conceptualized for the present study in terms of the students' corresponding learning goals. However, critics of the community college assert that it is the completion of programs and the earning of credentials that represent a successful outcome for community college students (Dougherty, 1988; Grubb, 1992; Monk-Turner, 1998). This view is based upon the university model and does not realistically address the nature of the modern community college, in terms of its role, scope, and mission for those students who do not plan on transferring or graduating.

In order to make some determinations about the relationship between epistemological beliefs and reasons for attending a community college, it is

necessary to first find out what the reasons for attending the community college really are. According to AACC (2000) and the Nunez Community College Fact Book (2000), students have a variety of reasons for choosing a community college over a four-year college or university. While transferring to a four-year college or university and earning a credential are both viable reasons, other reasons include training in specific skills in order to find, keep, or upgrade employment, personal growth through life-long learning opportunities, and opportunities to discover what future goals could be (Bauer et al., 1991; Freiden & Leimer, 1981; Sanchez & Laanan, 1998).

Rather than simply assume that community college students are all planning on graduating or transferring, the present study examines the relationships between five different categories of reasons for attendance and students' epistemological beliefs by asking students to rate specific reasons for attending on a Likert scale. The five categories and the specific reasons associated with them are:

1. Keep job: I need to brush up on my current skills in order to keep the job I currently have; I need to brush up on my current skills in order to get promoted in my job; and I need to learn new skills in order to keep the job I have.
2. Employer: My employer sent me to this course in order to brush up on skills I currently have; and my employer sent me to this course in order to learn a new skill or skills.

3. Find job: I need to brush up on my current skills in order to find a job; I need to learn new skills in order to find a job; and I want to learn new skills in order to find a better paying job.
4. Credential/transfer: I plan to earn a vocational or technical certificate; I plan to earn an associate degree; and I plan to transfer to a four-year college or university.
5. Personal growth: Coming to this college has nothing to do with my job now or in the future, or with transferring to a four-year university or earning a degree: I just enjoy going to classes and learning different things; and I'm not sure what I want to do in the future and community college seemed like a good place to find out.

Since there have been no studies to date about the relationship between such reasons for attendance and the epistemological beliefs of students, the present study will begin to address the gap in the literature. By observing the relationships between the reasons for attendance, the students' learning goals, and their effect on epistemological beliefs, community colleges will have a clearer understanding of their students' epistemic maturity level. Also important, though, are the background characteristics that also influence epistemological beliefs. Looking at background characteristics along with reasons for attending community college will enable colleges to discover their students' probable level of sophistication. This information can then be used to make decisions about delivery of course content, teaching, and other educational services.

How Epistemological Beliefs Have Been Studied and Measured Uni-Dimensionally

For several decades, educational researchers have been studying the phenomenon that the way students feel and think about learning affects the way they learn. As interest in the subject has grown, different ways to measure beliefs about knowledge and learning have also emerged. Much of the initial research into students' ways of learning and knowing was done through interviews. Perry (1968) pioneered the research with his interviews with students that followed a paper and pencil instrument that he devised called the Checklist of Educational Values (CLEV). The checklist provided Perry and his colleagues with a starting point of student beliefs that they then further explored through longitudinal interviews over a four-year period.

Perry's model identified nine different intellectual positions through which students grow as they progress through college. The first three positions are dualistic in nature, where authority (the teacher) is right and knowledge is absolute. These three positions are

1. basic duality, where learning means the acquisition of facts from the absolute authority, who knows the right answers;
2. multiplicity pre-legitimate, the position in which the student begins to find some diversity of opinions as to the right answer, but primarily is still dependent upon the authority to provide the facts; and
3. multiplicity subordinate, where the student may upon occasion encounter an

absolute authority who may not know everything, but only because the authority hasn't found the right answer yet.

The next three positions of Perry's model occur when the student begins to accept that there just may be a multitude of right answers, depending upon context and contingency. These positions are

4. multiplicity correlate or relativism subordinate, where the student finds that there can be a diversity of opinion, to which each person may be entitled, and that reasoning is contextual; however, there is still a belief that there is a right answer;
5. relativisim correlate, competing or diffuse, where the student begins to perceive that knowledge may be contextual and relativistic and begins to subordinate dualistic functions to special cases; and
6. commitment foreseen, where students have begun to accept multiple stances on issues, and begin to understand that they must orient themselves in some form of commitment.

And finally in Perry's model, students begin to take a personal stand on certain issues, and realize that they can use their personal experiences as values for the commitments that they make. These positions are

7. initial commitment, where the student takes a personal stand on some issue;
8. orientation in the implication of commitment, where the student begins to explore the responsibility of the commitment made; and
9. developing commitment, which is when the student realizes that an on-going

part of life will be the commitment to many responsibilities and issues. As students move through college, they may stop along the way in the growth of their epistemological beliefs. However, as they mature, so do their beliefs.

King and Kitchener (1981) used the basics of Perry's work to develop their theory that describes the development of assumptions that people, particularly college students, older adolescents, and adults, make about knowledge. They were especially interested in learning about what people think can and cannot be known, how people can really know something, and how positive people can be about what they know. In their Reflective Judgment Interviews, they ask participants to respond to problems where experts would not agree upon a correct solution.

The resulting model is a development model of seven stages, beginning with the first stage where people believe that knowledge can be absolutely gained through direct observation. Knowledge, at this stage, is reality and absolutely certain. As people move through the stages, an uncertainty about absolute knowledge begins to become apparent until finally at stage seven, people believe that some knowledge claims are better or more complete. People who reach stage seven have begun to evaluate and integrate data. This model has been tested using the Reflective Judgment Interviews in at least 30 studies with longitudinal and cross-sectional designs (Duell & Schommer, 2001).

Another theory of epistemological beliefs was created by Boyes and Chandler (1992), using their instrument entitled the Epistemic Doubt Interview.

Their research focuses on young people's beliefs about the certainty of knowledge and they hypothesize that young people pass through three soft stages of epistemic development and finally reach a fourth stage. Level 0 is the Naively Realistic Stage, where knowledge is based upon simple observation. When there is disagreement about what is real, it is because the person with the opposing viewpoint simply observed something different. These differences can be resolved by all participants observing the same thing.

Level 1 is Defended Realism. Children, in early school years, begin to realize that people can have different opinions and personal preferences. Level 2 is Dogmatism-Skepticism, where children and young people now acknowledge more general doubt or uncertainty. Knowledge is now seen as constructed, not simply observed. With this acknowledgment comes one of two responses: dogmatic thinking, clinging to the knowledge that has been handed down by authority; or skeptic thinking, abandoning all hope of rational consensus and assuming that any knowledge is good. Finally, Level 3 is Postskeptical Rational. Postskeptical rational learners believe that rational decisions can be made even with only partial certainty of knowledge. These learners believe that they can determine if one choice is better than other choices.

Boyes and Chandler suggest that epistemic development is linked to growth of personal identity. Naïve or Defended Realists are likely to be committed to a life choice based upon the uncritical adoption of some authority figure or may not be committed to any life choice at all, where Postskeptical

Rationalists have gone through crises and have made life choices.

The instrument that they use is the Epistemic Doubt Interview, in which the participants are presented two vignettes. Participants are asked to articulate arguments for both sides of each issue and to reach a resolution. A final set of probes is presented so that participants can reframe their arguments if they wish to and to describe what is common between the two vignettes. The process is designed to provide the opportunity to probe the participants' beliefs about the uncertainty of knowledge.

In the 1970's, Belenky, Clinchy, Goldberger, and Tarule developed an approach to study women's ways of knowing. Their instrument led to the theory that women know and learn differently from the way men know and learn. In interviews that lasted from three to five hours each with 135 women from nine different educational institutions, Belenky, et al.asked broad contextual questions as well as questions specifically designed to assess Perry's epistemological positions.

After transcribing all interviews, they attempted to classify the data according to Perry's scheme. What they found was that the data from the women's interviews did not all fit neatly into Perry's model. Therefore, they developed their own different epistemological perspectives. They generated five epistemological categories or stages, though they were cautious to say that they did not believe that learners moved through these stages in any fixed sequence. The categories are:

1. Silence, in which the women felt ignorant and dependent upon outside authority to tell them what to know. They felt they had no voice.
2. Received knowing, in which the women learned by listening. Knowledge is certain, and is more likely to come from an authority figure.
3. Subjective knowing, in which the women had modest intuitive reactions to learning. Women begin to experience truth, though at this stage, they do not actively pursue it or seek it out.
4. Procedural knowing, in which the women acquire knowledge by either separate knowing, where knowledge is internal and external influences are questioned and doubted until proven, or connected knowing, where knowledge comes from taking the perspectives of others.
5. Constructed knowing, in which women attempt to integrate subjective knowing with procedures learned from outside sources. Knowledge is constructed by the knower and is an intimate part of the knower.

Consistent in all of the theories presented and discussed in this section is the idea that beliefs about knowledge and learning are, while highly complex, essentially uni-dimensional in nature. With all of these theories, the assumption is that students pass through one stage of epistemic development before moving to the next stage, maturing (hopefully) in the level of sophistication of beliefs as they go. As described in the following section, this assumption has now been convincingly challenged. Newer research has begun to show that beliefs about learning and knowledge may be multi-dimensional. The latest theories test the

idea that students may be more or less sophisticated across a range of stages of epistemological beliefs and may even be sophisticated in some dimensions of beliefs and naïve in others.

Multi-Dimensional Theories of Epistemological Beliefs

Nearly all previous research proposes that learners move through stages of learning, moving from one stage to another, though not necessarily in a fixed sequence. Schommer (1990) proposed that a better way to view personal epistemologies would be to look at them as a system of more-or-less independent beliefs, making the argument that a system of beliefs is multi-dimensional. She first proposed five beliefs, using the foundations laid by earlier researchers in the field. The original beliefs were:

1. The structure of knowledge; ranging from isolated bits and pieces to integrated concepts;
2. The stability of knowledge; ranging from unchanging to continually changing;
3. The source of knowledge; ranging from handed down by authority to derived from empirical evidence and reasoning;
4. The speed of learning; ranging from quick all-or-nothing to gradual; and
5. The ability to learn; ranging from fixed at birth to improvable over time and experience (Duell & Schommer-Aikins, 2001).

Because Schommer conceptualized these dimensions as more-or-less independent, the dimensions may not develop at the same rate. One cannot

assume that all beliefs are in the same phase or level of development or even in sync with each other. In order to test this theory, Schommer created a survey instrument of 63 items, on which participants use a five-point Likert scale to respond to each item. Using exploratory factor analysis and mean scores from the subsets of items, four of the five hypothesized beliefs were generated. These four are base on (a) structure of knowledge, (b) speed of learning, (c) stability of knowledge, and (d) ability to learn (Duell & Schommer-Aikins, 2001; Kahn, 2000; Schommer, 1990; Schommer, 1998).

Other researchers have used Schommer's Epistemological Questionnaire in their own follow-up studies on multi-dimensional epistemological beliefs. The studies mentioned previously, Enman and Lupart (2000), Jehng et al. (1993), Kahn (2000), Paulsen and Feldman (1999a, 1999b), and Paulsen and Wells (1998), have all used the Epistemological Questionnaire as it stands or with slight modifications in the wording of questionnaire items, or have used it with other previously established instruments, measuring constructs about learning, motivation to learn, and learning strategies. The present study too will use Schommer's Epistemological Questionnaire to look at the way the epistemological beliefs of community college students are related to the students' different reasons for attending a community college -- as conceptualized in terms of different learning goals to be achieved.

Summary of the Literature and Conceptual Framework for the Study

Since the 1960's educators have been trying to understand and interpret

the way students view knowledge and learning. Initial research concentrated on the idea that epistemological beliefs were unidimensional in nature and were best represented as stages through which students move as they mature intellectually and developmentally (Baxter Magolda, 1992; Belenky et al., 1986; Perry, 1968). Reasons for the different investigations and studies varied, but implications for pedagogy were apparent and similar across nearly all studies.

In the 1990's Schommer introduced the reconceptualization that views about learning and knowledge are multi-dimensional, with at least four dimensions that are more-or-less independent of each other. Individuals grow in each epistemological belief separate from each other belief; growth or sophistication in one dimension does not necessarily mean that the individual has the same level of sophistication in any of the other beliefs, since each belief exists along a continuum ranging from naïve to sophisticated.

As interest in the topic grew, in part due to Schommer's reconceptualization that epistemological beliefs are not simply a series of stages through which one grows, but are a set of at least four more-or-less independent beliefs, so has other research, using her four-dimensional model (Comerford et al., 2000; Jehng et al., 1993; Paulsen & Feldman, 1999a, 1999b; Paulsen & Wells, 1998). What also became apparent in this research is that there are some readily identifiable background characteristics that contribute to the development of students' epistemological beliefs.

Many of these contributing factors are the background variables examined

in previous sections of this chapter, such as parents' education, students' educational levels, academic achievement, major field of study, age, and gender. Several studies have found that gender has a significant relationship to epistemological beliefs (Paulsen & Wells, 1998; Schommer, 1993; Schommer & Walker, 1995); Comerford et al., (2000), Kahn (2000), and Jehng et al., (1993) found that students' educational levels made a difference in beliefs; and Paulsen and Wells (1998) found that GPA is related to beliefs. Other work has been done on differences in beliefs across domains or major fields of study (Jehng et al., 1993; Kahn, 2000; Paulsen & Wells, 1998; Schommer & Walker, 1995). Age and parental education have also been found to be related to development of epistemological beliefs in several studies (Paulsen & Wells, 1998; Schommer, 1993, 1998).

As interesting and compelling as this research has been so far, it is apparent that there have been some factors that have not yet been considered in the development of students' views or beliefs about the nature of learning and knowledge. In other words, even though many studies have addressed the importance of understanding students' epistemological beliefs in terms of their implications for effective pedagogy (Baxter Magolda,1992; Belenky et al., 1986; Beers, 1988; Enman, & Lupart, 2000; Hofer & Pintrich, 1997; Paulsen & Gentry, 1995; Schommer, 1993, 1995, 1998), many other areas of considerable importance have remained largely unexamined. For example, very little work has been completed to date that investigates the epistemological beliefs of

community college students at all. There have been no studies that address the relationship between students' epistemological beliefs and the reasons why students choose to attend different kinds of institutions. And more specifically, there have been no studies that have examined the possibility that students' beliefs may differ according to the reasons that they attend an institution like the community college which has quite a multifarious mission. The present study intends to address these important gaps in the existing literature on the epistemological beliefs of college students.

Students have different reasons for attending college and achieving learning goals. By understanding the student's overall reason for attending a community college in the first place, it may be possible to see if that reason for attendance is being successfully addressed in the student's learning experiences. But if students are not achieving their respective learning goals, perhaps it is due to the differences of epistemological beliefs of the students or differences between beliefs of students and their teachers. Such differences may cause barriers to student learning, but may be possible to overcome once they are recognized and understood.

This study also examines what the students' own reasons for attending a community college actually are. The results of the present study may demonstrate that the reasons students attend community college are far more diverse -- which would be consistent with a multifarious mission of the community college -- than the traditional views that students attend college to earn a degree

or other credential. This research examines the beliefs about learning and knowledge that students bring to the community college classroom. Some research has shown that the more sophisticated the student's beliefs are, the better his/her academic performance is. By understanding the community college students' beliefs about knowledge and learning, the community college, and its faculty, should be better able to assist the students in achieving their learning goals, whatever the courses may be and for whatever reason the students are attending.

The purpose of this study, as illustrated in Figure 1 below, will be to examine whether the epistemological beliefs of community college students -- that is, their beliefs about the nature of knowledge and learning -- vary according to the students' reasons for attendance, while controlling for the effects on beliefs of other relevant background and educational characteristics of students. In Figure 1, the independent variables appear on the left side of the diagram. They represent categories of reasons for attending the community college and a set of background variables. The dependent variable -- that is, the epistemological beliefs of community college students, as measured along four dimensions -- is represented in the box on the right side of Figure 1 below.

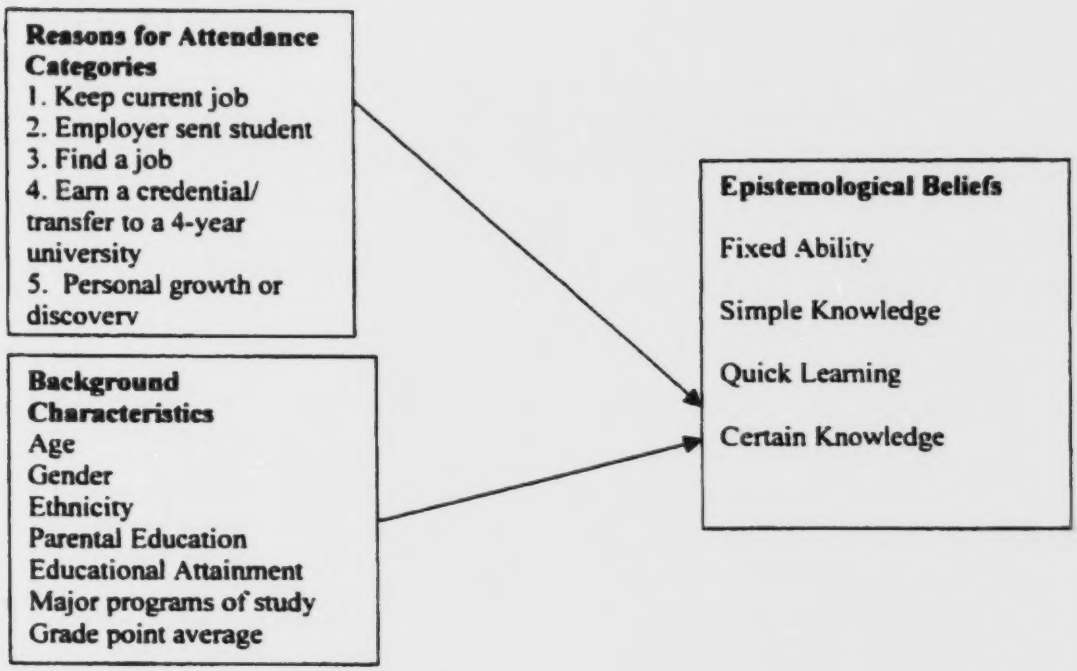

Figure 1: Conceptual Framework for the Study

CHAPTER THREE

Methodology

The Survey Design and Rationale

The purpose of this survey study was to examine whether the epistemological beliefs of community college students -- that is their beliefs about the nature of knowledge and learning -- vary according to students' reasons for attendance while controlling for the effects on beliefs of other relevant background and educational characteristics of students.

A survey approach was the chosen methodology for the study because of the potential to generalize attributes of a small sample to a larger population so that inferences could be made about the epistemological beliefs that students bring to their educational experiences at community college. In addition, since the researcher administered the survey to the participants personally, the turn-around time for data collection was kept to a minimum. Finally, the collection of data using a survey is consistent with the causal-comparative nature of the design for this study.

Data Collection

Permission was granted from Dr. Marlene Schommer-Aikins to use the Epistemological Questionnaire with a selected group of community college

students. The questionnaire featured the four dimensions or factors of epistemological beliefs defined in Chapter One. There are four dimensions of epistemological beliefs that are studied using this questionnaire. They are: fixed ability, which is the belief that the ability to learn is determined at birth; quick learning, which is the belief that learning occurs in a short amount of time or not at all; simple knowledge, which is the belief that knowledge is a series of isolated facts; and certain knowledge, which is the belief that knowledge is unchanging. The questionnaire contains sixty-three items where students rate statements on a Likert Scale from 1 (strongly disagree) to 5 (strongly agree).

In addition to the Epistemological Questionnaire, students were surveyed on a separate section to determine background information. The requested information was included with the questionnaire and included items to assess age, gender, ethnicity, parental education, major or discipline of study, expected grade point average, the number of classes in which students are enrolled for the semester, completion of secondary education, and reasons for attending the community college. There were, therefore, several independent variables examined in the study, in order to learn about their relationships with the dependent variable, students' epistemological beliefs.

Permission was granted by the chancellor of the local community college and the faculty at the community college selected as the site for the study were approached for access to their students for one class period after mid-term and prior to the end of the upcoming semester. Faculty in a variety of vocational,

academic, and technical disciplines agreed to participate and 75 classes were surveyed.

Population and Sample

The population studied was community college students enrolled in academic, vocational, and technical courses at comprehensive community colleges. The sample included 531 community college students enrolled in 75 classes at a local community college. The classes met during the day, evenings, nights, and weekends, so that all possible times for student attendance were covered by the study. Of the 531 surveys administered by the researcher, sixteen were eliminated completely from the study because participants did not sign the consent form granting the researcher permission to access student records and use their responses in the study. Another two were eliminated completely from the study because the respondents had skipped entire pages in the survey instrument itself. In addition, four students did not report on mother's education and one student did report his or her educational attainment. Because these instances are small in number, these five students were eliminated from the sample.

For the remaining 509 students who participated fully in the study, there were a small number of randomly missing values on the epistemological beliefs and reasons for attendance items. In the remaining 509 surveys used, the following number of scale items had missing values: 26 had one missing value, seven had two missing values, and two had three missing values. The missing values appeared to be randomly distributed and the percent of observations

missing for any one item ranged from 0% to .5%. The average score for the entire sample was assigned to those responses which had missing values, following the "mean-substitution approach" recommended by Hair et al. (1998, p. 54). Although this approach reduces the variance, it does not introduce bias into the sample or estimation procedures; it also permits the maintenance of a larger sample size. A similar approach was used to assign the sample mean for the expected GPA of 30 students (only 5.8% of the sample) who skipped that item.

The demographic profile of the local community college largely reflects that of the national demographics of community colleges in the United States (see Table Two). The local community college shows a slightly lower evidence of part-time enrollment at 45.5% compared to the national average of part-time enrollment at 63.3%, and enrollment for African American students at the local community college is higher than the national average. These differences can be partly explained by the location of the community college, which is in an urban setting, and the age of the general population in the local community, which is lower than the national average at approximately 30% of the population under age 20. However, there is no reason to think that results would not be generalizable to other urban community colleges with similar demographics in all other areas.

Table 2

Demographics Comparison Of National Community College Profile With Current Nunez Community College Profile

		All Community Colleges	Nunez Community College
Enrollment Status:	Part-time students	63.3%	45.5%
	Full-time students	36.7%	54.5%
Gender:	Female Students	57.9%	68.8%
	Male Students	42.1%	31.2%
Ethnicity:	Non-White Students	30.0%	29.1%
	[Black	11.1%	22.7%
	Native American	1.3%	1.8%
	Asian American	5.8%	1.6%
	Hispanic	11.8%	3.1%
	Resident Alien	3.8%	0.0%
	Unknown	1.9%	1.8%
	White Students	64.8%	69.0%
Age Groupings:	Under 18 years old	3.9%	2.9%
	18 to 19	20.0%	16.5%
	20 to 21	15.6%	16.0%
	22 to 24	13.1%	14.7%

Table 2 con't

25 to 29	13.8%	14.7%
30 to 34	9.4%	11.8%
35 to 39	8.0%	7.5%
40 to 49	10.4%	11.1%
50 to 64	3.9%	4.2%
65 or older	1.1%	0.5%
Age Unknown	0.8%	0.0%

Human Subjects Review

The protocol for a human subjects review was presented to the Human Subjects Review Committee at this university and an expedited review resulted in approval for the study.

Instrumentation

The survey used was Schommer's Epistemological Questionnaire. Permission was granted by Dr. Marlene Schommer-Aikins to use this questionnaire in the study. Sample items are included in this chapter in the section on dependent variables, and the complete instrument is in an appendix to this report.

The questionnaire has been piloted and retested in a variety of situations. Factor analysis, using orthogonal rotation, of the 63-item questionnaire yielded four epistemological factors (Hofer & Pintrich, 1997; Schommer, 1990, 1993). These factors, expressed in their naive form, are: fixed ability; simple knowledge; quick learning; and certain knowledge. In follow-up studies with high school students (Schommer, 1993), college and university students (Schommer et al., 1992), and adults (Schommer, 1998), exploratory and confirmatory factor analysis has consistently yielded the same four factors. The four-factor structure has been replicated in follow-up studies by different researchers using exploratory and confirmatory analysis and different samples (Schommer, 1990, 1993, 1998; Duell & Schommer, 2001). "Validity is reflected in that responses to this questionnaire has [sic] been found to predict comprehension, metacomprehension, interpretation of information, and integration of information" (Schommer, p. 360, 1993). Furthermore, these four factors have been found to be significantly related to students' motivation to learn and their use of effective learning strategies (Paulsen & Feldman, 1999a, 1999b). Additionally, content validity of has been established from the screening of the instrument by professionals in the field of educational psychology (Duell & Schommer-Aikins, 2001).

Schommer has reported questionnaire test-retest reliability coefficients of 0.70 to 0.74 and sub-scale reliability coefficients ranging from 0.68 to 0.85 within each belief factor (Duell & Schommer-Aikins, 2001; Enman & Lupart, 2000;

Schommer, 1994). The survey has been used by researchers in studies with students in high schools (Enman & Lupart, 2000), community colleges (Comerford et al., 2000; Schommer, 1993), and four-year colleges and universities (Kahn, 2000; Paulsen & Feldman, 1999a, 1999b; Paulsen & Wells, 1998; Schommer & Walker, 1997; Schommer, 1990, 1993, 1998).

The major content sections of the survey included a cover letter to the students, asking their permission to use student record information in this study, asking them to record their Social Security number, and to sign indicating their permission. The next section of the survey instrument was the Epistemological Questionnaire; the last section contained items which pertained to demographic and background information such as age, gender, ethnicity, parental education, major or discipline of study, number of classes in which they are enrolled for the semester, level of completion of secondary education, workplace experience, expected GPA, and reasons for attending the community college. Participants were allowed to seal their surveys in an envelope and sign across the back to ensure confidentiality.

Because the survey was administered by the researcher, a reminder memo was sent to the faculty who agreed to participate and another reminder was sent at mid-term, which began at the community college on October 15, 2001. A schedule of the times to visit the classes was created, and included day, evening, and weekend classes. Survey administration, which began the week of mid-term, and ended in early December.

Variables in the Study

Dependent Variables

The dependent variables in this study are the epistemological beliefs of the community college students on each of the four dimensions. By learning how community college students view learning and knowledge, decisions can be made to better serve them in their pursuit of their learning goals, in accordance with their respective reasons for attendance. Research and practice has shown that epistemological beliefs are related to how well students can achieve their learning goals (Paulsen & Feldman, 1999a, 1999b; Paulsen & Gentry, 1995; Schommer, 1990).

These beliefs were assessed by using Schommer's Epistemological Questionnaire. On this questionnaire, students responded to 63 items on a five-point Likert Scale ranging from "strongly disagree" to "strongly agree." Students' beliefs on each of the four dimensions of epistemological beliefs, which are fixed ability, quick learning, simple knowledge and certain knowledge, were determined. Students' beliefs ranged from naïve to sophisticated. Higher numerical scores on each dimension correspond to more naïve beliefs, with lower scores, therefore, corresponding to more sophisticated beliefs.

Descriptions of the epistemological dimensions or factors with examples of the items are:

1. Fixed ability is the belief that the ability to learn is determined at birth. Examples of items to assess this dimension are: "Almost all the

information you can learn from a textbook you will get during the first reading; "Self-help books are not much help;" and "The really smart students don't have to work hard to do well in school."

2. Simple-unambiguous knowledge is the belief that knowledge is a series of isolated facts. Examples of items to assess this dimension are: "I find it refreshing to think about issues the authorities can't agree on"; "Most words have one clear meaning"; and "When I study I look for specific facts."

3. Quick learning is the belief that learning occurs in a short amount of time or not at all. Examples of items that assess this dimension are : "Successful students can learn things quickly;" "If a person can't understand something within a short amount of time, they should keep on trying;" and "Working hard on a difficult problem for an extended period of time only pays off for really smart students."

4. Certain knowledge is the belief that knowledge is unchanging. Examples of the items that assess this dimension are: "The only thing that is certain is uncertainty itself; " "If scientists try hard enough, they can find the truth to almost everything;" and "Truth is unchanging." (Schommer, 1993).

Independent Variables

The independent variables that were used for this study are: age, gender, ethnicity, parental level of education, level of completion of secondary education, expected GPA, and reasons for attendance. Data for these variables were

collected on a demographic and background survey attached to the Epistemological Questionnaire. In addition, participants were asked for permission to access their records through the Registrar's Office. On the cover sheet of the questionnaire, students were asked to record their Social Security number on the form, indicating their permission to access their records and their willingness to participate in the study. In addition, the researcher recorded the necessary identifying information for the course students were taking when they completed the survey.

Reasons for attendance

A list of possible reasons for attendance was created, based upon discussions with members of a panel comprised of admissions personnel and counselors at the community college selected for the study, and after a careful review of the admissions forms on which students at the sample college designate a reason for attending college. After its initial development by the researcher, this list was given to the counselor and admissions personnel involved in its creation to determine if they felt that other reasons needed to be added or any reason needed to be deleted or revised. This same group felt that this list sufficiently represented the reasons that they have heard students give for attending community college. In fact, this sort of list is currently being developed for use by the State Department of Education through a private company, according to the Dean of Student Affairs, also a member of the panel. The panelists were Donna Clark, Dean of Student Affairs; Nancy King, Student

Life Coordinator; Kim Ingram, Counselor and ADA Coordinator; and Holly Delacroix, Director of Admissions.

In focus group interviews with students at the community college, the list of reasons for attendance was piloted to determine if students agreed with the list itself and with the meanings of each of the items. In two separate focus group sessions, student workers in both the Business Affairs and the Student Affairs offices met with the researcher to read and discuss the list of reasons. They were also asked to discuss their interpretation of the rating scale of "This is not at all true of me" to "This is very true of me." The students offered various insights into the list of reasons; one reason was slightly reworded to better express the reason from a student perspective and another reason was added to the list.

The original reason number 12 stated, "Coming to this college has nothing to do with my job now or in the future; I just enjoy going to classes and learning new things." Number 12 was rewritten after the focus group interviews to read, "Coming to this college has nothing to do with my job now or in the future or with transferring to a four-year college or university or earning a degree; I just enjoy going to classes and learning different things." The students stated that the original version did not address the fact that the students may also not want to transfer or earn a credential at this time, in addition to not coming to college for employment purposes. Reason 13 was added after much discussion that sometimes students don't know what they want to do in the future and that the community college offered a place for discovery.

The reasons were rated on a Likert scale from one, with one being "This is not at all true of me" to six, with six being "This is very true of me." The reasons are:

1. I plan to earn a vocational or technical certificate
2. I plan to earn an associate degree
3. I plan to transfer to a four-year college or university
4. My employer has sent me to this course to learn a new skill or skills
5. My employer has sent me to this course in order to brush up on skills I currently have
6. I need to brush up on my current skills in order to find a job
7. I need to brush up on my current skills in order to keep the job I have
8. I need to brush up on my current skills in order to get promoted in my job
9. I need to learn new skills in order to find a job
10. I need to learn new skills in order to keep the job I have
11. I want to learn new skills in order to find a better paying job
12. Coming to this college has nothing to do with my job now or in the future or with transferring to a four-year college or university or earning a degree; I just enjoy going to classes and learning different things.
13. I'm not sure what I want to do in the future, and community college seemed like a good place to find out.

Level of Secondary Education

This variable was included in the survey because there are indications

from previous research that the more education students have the less likely they are to hold more naïve epistemological beliefs. This variable was classified into two groups: completed high school or received GED=1, or neither completed high school nor received GED=0.

Mother's Level of Education

Mother's education was coded into one of the following groups: 8th grade or less, some high school, and high school graduate were coded as 0; some college, college graduate, some graduate work, graduate degree, and professional degree were coded as 1. Previous research documents the importance of mother's education in the development of epistemological beliefs (Comerford et al., 2000; Kahn, 2000; Schommer, 1993); therefore mother's education was used in the regression analysis to measure parental level of education.

Age/Date of Birth

This variable was coded as a continuous variable, using the exact date of birth.

Gender

Gender was coded as a dichotomous variable. Male was coded 0 and female was coded 1.

Major programs of study

Students were asked to identify their main programs of study. For many of them, it is possible that they have not yet declared majors or made decisions

about their courses of study. In fact, because one of the reasons they were asked to rate deals with the fact that they may not know, a selection of "Undecided/Non-degree" was allowed. In addition, the college offers five different associate degree programs in 21 different majors, 21 certificate programs, and over 500 different kinds of classes (including remedial classes and ESL courses). Those students who had declared a major in the vocational or technical fields were coded as vocational major = 1; those whose majors were not in the vocational technical areas were coded with vocational major = 0. Those programs include majors such as accounting, air conditioning and heating, electrical construction, and business management. Students in these majors are usually enrolled in associate of applied science, associate of business studies or certificate programs. Students with "Undecided" or "Non-degree" were coded as nonmajor = 1; students with declared majors were coded with nonmajor = 0. Those students who had declared majors in an academic field (some examples are early childhood education, sociology, paralegal studies, or general studies) constituted the comparison group for this design set of dichotomous variables. Students in these majors are usually enrolled in associate of science, associate of arts, or associate of general studies programs.

Ethnicity

Students were asked to self-identify their ethnic backgrounds, using the following designations: African-American, Asian-American, Caucasian, Hispanic, Native American/Alaskan Native or Other. Students who were African American

were coded as AfAm =1; those who were not African American were coded as AfAm = 0. Those students who were Asian-American were coded as AsAm = 1; all others were coded as AsAm = 0. Hispanic students were coded as Hispanic = 1; all others were Hispanic = 0. Students who identified themselves as Other were coded Other =1, with all others being coded Other = 0. Caucasian constituted the comparison group for this design set of dichotomies.

Research Questions

The survey study attempted to answer the following questions:

1. What are the student's epistemological beliefs?
2. What are the student's reasons for attending a community college?
3. Do these beliefs about knowledge and learning differ according to students' reasons for attendance?
4. Do these beliefs about knowledge and learning differ according to selected background characteristics?

In order to answer these questions, the study tested the following hypotheses:

1. Epistemological beliefs of community college students will vary according to their reasons for attendance.

2. There will be relationships between students' epistemological beliefs and their background characteristics. The hypothesized relationships are:

    a. Older students will be more likely to hold less naïve beliefs than will younger students

    b. Students who have completed a higher level of secondary

education will be more likely to hold less naïve beliefs than will students who have a lesser level of secondary education.

c. Students whose mothers have a higher level of education will be more likely to hold less naïve beliefs than will those whose mothers hold a lesser level of education.

d. Students' beliefs will vary according to gender and ethnicity, but there are no directional hypotheses regarding the relationship between beliefs and gender or ethnicity.

e. Students' beliefs will vary according to their major programs of study, but there is no directional hypotheses about the nature of the relationship.

Data Analysis

Once the survey items were completed and entered into SAS v. 8 for Windows, the hypotheses were tested using multiple regression analysis. Each epistemological factor or dimension was regressed on the independent variables to determine if reasons for attendance and demographic and background characteristics could explain variations in students' epistemological beliefs.

However, during the initial multiple regression models, diagnostic tests for multicollinearity showed a problematic level of tolerance and variation inflation factors, with levels approaching .2 of TOL and approaching 5 of VIF between reason items. These results showed evidence of substantial multicollinearity. In addition, bivariate correlations showed very high correlations among independent

variables in reason item pairs. For example, the bivariate correlation between reason items 4 and 5 was 0.87387, and between items 7 and 10 it was 0.72990.

At that point, a decision was made to address the problem of multicollinearity among similar reason items by conducting exploratory factor analysis with orthogonal rotation. Exploratory factor analysis of the thirteen reason items was performed using SAS v.8 for Windows. The analysis was used to create an entirely new set of variables that would be used for the subsequent multiple regression models. Doing so allowed the researcher to keep the nature and character of the original variables, but reduced their number from thirteen to five (Hair et al., 1998).

The five factors were selected by use of the eigenvalue criterion; only those factors having eigenvalues of 1 or greater were considered significant, and they are shown in Table Three. The thirteen reasons loaded cleanly onto five different factors, with no reason loading substantially onto more than one factor. In addition, a scree plot was used to identify the number of factors to extract. It, too, supported the creation of five factors from the reasons variables. Additionally, each reason item loaded onto one and only one of the five factors at a coefficient of .41 or above (see Table Three). Guidelines for identifying significant factor loadings based on sample size state that, for studies with a sample size of 350 or more, factor loadings of at least .30 are required for significance (Hair et al., 1998).

The factors were created using the Varimax rotation method. This method

produces a more readily interpretable solution and maintains orthogonality of the factors so that they can be used as independent variables in subsequent regressions (Cody & Smith, 1997; Hair et al., 1998).

Table 3

Rotated Factor Pattern: Varimax Procedure

Reason Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Ritem 1	0.06311	0.25703	0.26322	-0.63699	0.08320
Ritem 2	0.06224	0.04518	0.23813	-0.41712	-0.34975
Ritem 3	0.00312	0.04989	0.04894	0.76751	-0.03363
Ritem 4	0.26441	0.91973	-0.01265	-0.06702	0.02340
Ritem 5	0.23737	0.92266	0.01475	-0.06927	0.06143
Ritem 6	0.24896	0.09474	0.68043	-0.17253	0.15197
Ritem 7	0.84788	0.23392	0.09792	-0.03532	0.10317
Ritem 8	0.70120	0.17087	0.13007	-0.04423	-0.04055
Ritem 9	-0.06938	-0.02592	0.82861	-0.09888	0.07158
Ritem 10	0.85958	0.12153	0.03203	-0.02987	0.05225
Ritem 11	0.11556	-0.02781	0.69997	0.02285	-0.15653
Ritem 12	0.29404	-0.06384	-0.19886	-0.33374	0.56697
Ritem 13	-0.02396	0.13057	0.19385	0.07249	0.82042

The five factors were labeled according to the patterns that were revealed in terms of the reason items that substantially loaded onto them. The five factors are:

1. Factor One: Keep job. The reason items that substantially loaded onto this factor are numbers 7, 8, and 10, and all of them deal with keeping the employment the student currently has.
2. Factor Two: Employer. The reason items that substantially loaded onto this factor are numbers 4 and 5. Both of these reason items deal with the fact that the employer has sent the student to community college or requested that the student attend community college in order to learn or enhance skills.
3. Factor Three: Find job. The reason items that substantially loaded onto this factor are numbers 6, 9, and 11. These reason items deal with the fact that the student is attending community college in order to learn or enhance skills that will enable him/her to find a job or a better paying job.
4. Factor Four: Credential/transfer. The reason items that substantially loaded onto this factor are numbers 1, 2, and 3. Each of these reason items deals with the fact that the student is attending community college in order to earn a credential or to transfer to a four-year university to earn a credential there.
5. Factor Five: Personal growth. The reason items substantially that loaded onto this factor are numbers 12 and 13. These reason items deal with the

fact that students are attending community college in order to find out what they want to do in the future or to learn new things that are not necessarily job or future related.

The following equation and its symbols can be used to express the relationships and specific hypotheses that were tested:

$EB_{ij}=a_0 + a_1B_1 + \ldots + a_7 B_7 + a_8 F_1 + \ldots + a_{12}F_5 + E_i$

where i = 1... N (students)

where j = 1... 4 (Epistemological belief dimensions)

B_1 = the student's level of completion of secondary education

B_2 = the level of the students' mothers' education

B_3 = age/birth date of student

B_4 = the student's gender (male = 1, female = 0)

B_5 = the student's ethnic background

B_6 = the student's major field of study

B_7 = the student's grade point average on a 4.00 scale

F_1=Factor one: keep job

F_2=Factor two: employer

F_3=Factor three: find job

F_4=Factor four: credential/transfer

F_5=Factor five: personal growth

a_0 = net effect on epistemological beliefs of excluded variables

a_1 = $\underline{\text{change in EB}}$

a_1 = change in EB / change in B_1

For each one-unit increase in the value of B_1 (B_1 = student's level of secondary education), epistemological beliefs change by amount a_1, all else equal. The hypothesis is $a_1 < 0$.

a_2 = change in EB / change in B_2

For each one-unit increase in the value of B_2 (B_2 = the level of the students' mothers' education), epistemological beliefs change by amount a_2, all else equal. The hypothesis is $a_2 < 0$.

a_3 = change in EB / change in B_3

For each one-unit increase in the value of B_3 (B_3 = age/date of birth of student), epistemological beliefs change by amount a_3, all else equal. The hypothesis is $a_3 < 0$.

a_4 = change in EB / change in B_4

For each one-unit increase in the value of B_4 (B_4 = the student's gender (male = 0, female = 1)), epistemological beliefs change by amount a_4, all else equal. The hypothesis is $a_4 < 0$.

a_5 = change in EB / change in B_5

For each one-unit change in the value of B_5, (B_5 = the student's ethnic

background), epistemological beliefs change by amount a_5, all else equal. The hypothesis is $a_5 = 0$.

$a_6 = \frac{\text{change in EB}}{\text{change in } B_6}$

For each one-unit change in the value of B_6 (B_6 = the student's major field of study), epistemological beliefs change by amount a_6, all else equal. The hypothesis is $a_6 = 0$

$a_7 = \frac{\text{change in EB}}{\text{change in } B_7}$

For each one-unit increase in the value of B_7 (B_7= student's grade point average on a 4.00 scale), epistemological beliefs change by amount a_7, all else equal. The hypothesis is $a_7 < 0$.

$a_8 = \frac{\text{change in EB}}{\text{change in } F_1}$

For each one-unit increase in the value of F_1 (F_1 = Factor One: Keep job), epistemological beliefs change by amount a_8, all else equal. The hypothesis is $a_8 = 0$.

$a_9 = \frac{\text{change in EB}}{\text{change in } F_2}$

For each one-unit increase in the value of F_2 (F_2 = Factor Two: Employer), epistemological beliefs change by amount a_9, all else equal. The hypothesis is a_9

= 0.

a_{10} = change in EB

change in F_3

For each one-unit change in the value of F_3, (F_3 = Factor Three: Find job), epistemological beliefs change by amount a_{10}, all else equal. The hypothesis is $a_{10} = 0$.

a_{11} = change in EB

change in F_4

For each one-unit change in the value of F_4 (F_4 Factor Four: Credential/Transfer), epistemological beliefs change by amount a_{11}, all else equal. The hypothesis is $a_{11} = 0$

a_{12}= change in EB

change in F_5

For each one-unit increase in the value of F_5 (F_5 = Factor Five: Personal Growth), epistemological beliefs change by amount a_{12}, all else equal. The hypothesis is $a_{12} = 0$.

Assumptions of the Regression Model

When using multiple regression to estimate the coefficients of the model, there are several assumptions that must be made. These assumptions are:

1. The relationship between E(Y) and each X_i is linear;
2. The effects of the k independent variables are additive;
3. All variables must be measured at the interval level and without error;

4. For each set of values for the k independent variables (X_{1j}, X_{2j},..., X_{kj}), $E(_{Ej})$=0 (i.e., the mean value of the error term is 0);
5. For each set of values for the k independent variables, VAR $(_{Ej})$ = $(^2$ (i.e., the variance of the error term is constant);
6. For any two set of values for the k independent variables, COV $(_{Ej,Eh})$= 0 (i.e., the error terms are uncorrelated; thus there is no autocorrelation);
7. For each X_i, COV $(X_{i,E})$ = 0 (i.e., each independent variable is uncorrelated to the error term);
8. There is no perfect collinearity—no independent variable is perfectly linearly related to one or more of the other independent variables in the model; and
9. For each set of values for the k independent variables, $_{Ej}$ is normally distributed (Berry & Feldman, p. 10-11, 1985).

Delimitations and Limitations

This exploratory study was delimited to surveying students enrolled at a local community college. Students enrolled in courses in both the academic disciplines and the vocational disciplines were surveyed about their epistemological beliefs using Schommer's Epistemological Questionnaire. This convenience sample was obtained by asking faculty members for access to one or more of their class periods in order to administer the survey. Since this sample was drawn from those students attending one particular community college, this may decrease the generalizability of this study's findings. Nevertheless, the local community college to be studied has a population demographic similar to the

national picture of the average community college student, and the results of this study may be generalizable to the experiences of other colleges and students with similar demographic profiles.

It was anticipated that students' ratings for some of the reasons for attending college listed on the survey might be influenced, at least in part, by the unique conditions of the local economy at the time of the survey. It is well established in the literature, that college enrollment decisions reflect the nature of economic conditions, often with increased enrollment during times of economic hardship (Paulsen, 1990). During times of economic prosperity, students' reasons for attending college will tend to differ from reasons for attending during times of economic down-turns. However, even though rates of unemployment may affect the results of this survey, the same would be true of any survey administered to any group of students at any community or other type of college. And more importantly, there is no reason to suspect that correlation between economic conditions and students' ratings of reasons for attendance would, in any way, affect the nature of the hypothesized relationship between reasons for attendance and epistemological beliefs of community college students in this study.

Some demographic and background characteristics of students appear to change depending upon the time of day the students are enrolled in classes. For example, the majority of employed students seem to take classes in the evenings, while the students who take classes during the day are often

unemployed or under-employed. In addition, many of the courses from the technical programs at the community college that will be included in the sample are offered only during the day. Therefore, the researcher included a variety of day, evening, and weekend classes in the study

Considerable effort was dedicated to the generation of a comprehensive list of possible reasons that students might have for attendance at community colleges. Nevertheless, in spite of the recommendations of the panelists and the students in two separate focus group interviews, one possible limitation of the study is that the list of reasons identified and included on the survey may not include all possible reasons for attendance.

Summary

This exploratory study examines the relationships between community college students' beliefs about knowledge and learning, their reasons for attending community college, and selected background factors. The sample was drawn from a public community college and the students who participated completed Schommer's 63-item Epistemological Questionnaire, a demographic survey, and a consent form allowing access to student records. Statistical procedures that were used to test the hypotheses were factor analysis, multiple regression analysis, descriptive statistics, and multicollinearity diagnostics.

Chapter Four presents the results of the study and Chapter Five summarizes the study with discussion about implications of the findings for theory, policy, practice and further research.

CHAPTER FOUR

Findings

This exploratory study examined the differences in epistemological beliefs of community college students with varying reasons for attending college. The data source was a sample of community college students drawn from a local community college. The demographics of the local community college very closely match those of the national population of community college students. The researcher used Schommer's Epistemological Questionnaire and a questionnaire developed by the researcher to determine what students' reasons are for attending community college. The study examines the relationship between students' epistemological beliefs, and their background characteristics and reasons for attending community college.

Descriptive Statistics

Descriptive statistics for this study are presented in Tables 4 to 11. The frequencies and percentages of the sample possessing each background characteristic are presented in Table 4. The mean of each continuous variable is presented in Table 5. A discussion of the findings of the descriptive statistics follows Tables 4 and 5. The means of each reason item are presented for each of the five factors in Table 6. A description of the means of the reason items

follows Table 6.

Table 4

Descriptive Statistics of Background Characteristics: Frequencies

	Number of Participants	% of sample population
Background demographics		
Gender		
Male	166	32.30
Female	348	67.70
Ethnicity		
African American	77	15.13
Asian American	17	3.34
Hispanic	27	5.30
Other (non-Caucasian)	29	5.70
Caucasian	359	70.53
Educational Attainment		
High School or GED	496	97.45
Neither High School or GED	13	2.55
Mother's Education		
High School or less	310	60.90
Some college or more	199	39.10

Programs of Study		
Vocational major	206	40.47
Non-degree seeking	45	8.84
Academic major	258	50.69

Table 5

Descriptive Statistics of Background Characteristics: Means

Variable	Mean	Standard Deviation	Minimum	Maximum
Age	27.052	10.040	17.00	65.00
GPA Expected	3.23	0.538	0.90	4.00

Background Characteristics. Background characteristics consist of gender, ethnicity, educational attainment, mother's education, major programs, age, and reported grade point average.

Gender. In the sample studied, the distribution of gender is similar to the national population of the community college students, as well as the population of the community college as a whole in this study. In the sample studied, 32.30% of the participants were male, 67.70% were female. In the national community college demographic profile, 55.4% are female and 44.6% are male. Earlier studies of epistemological beliefs show a relationship between gender (in particular,

females generally are less likely to be naïve in their beliefs) and the level of sophistication of beliefs. Several studies have found that gender has a significant relationship to epistemological beliefs (Paulsen & Wells, 1998; Schommer, 1993; Schommer & Walker, 1995).

Ethnicity. In the sample studied, 15.13% of the participants were African American, while the national demographic profile show that 11.1% of all community college students are African American. 3.34% of the sample were Asian American, while the national demographic is 5.8% of the community college population is Asian American. 5.30% of the sample studied was Hispanic, and nationally 11.8% of all community college students are Hispanic. There has been little previous research on any sort of relationship between ethnicity and level of sophistication of epistemological beliefs of college students.

Age. The average age of the sample studied is 27.052, with ages ranging from 17 years to 65 years. The national average of the community college student is 26 years, with ranges from less than 18 to older than 65 and 46% of them over 26 years of age. Both the sample and the population have a student demographic of non-traditionally aged students. Earlier studies show some relationship between age and sophistication of belief, with age being positively correlated to a higher level of sophistication. Age has been found to be related to development of epistemological beliefs in several studies (Paulsen & Wells, 1998; Schommer, 1998).

Educational Attainment. Of the participants in the study, 496 of them (or 97.45%)

had obtained at least a GED or a high school diploma. Thirteen or 2.55% had earned neither. Previous research has shown that those college students who had a higher level of secondary education are more likely to be less naïve than those students with a lower level of secondary education. Comerford et al., (2000), Kahn (2000), and Jehng et al., (1993) found that students' educational levels made a difference in beliefs.

Mother's Education. In the sample, 60.90% (310 participants) of the students' mothers had an educational level of high school or less, while 39.10%(199 participants) of them had mothers with some college or more. Previous studies in epistemological beliefs show that of both parents' education, mother's educational level is the most influential on the students' beliefs (Comerford et al., 2000; Kahn, 2000; Schommer, 1997).

Major Programs. Students in the sample have declared majors in both academic programs and in vocational/technical programs. In addition, some students had not declared a major as of the survey administration date or had declared themselves as non-degree seeking. Of the participants in the survey, 206 of them (40.47%) had programs of study in the vocational/technical programs, 258 students had declared majors in academic areas, and 45 of them (8.84%) were non-degree seeking or undeclared. Some research has shown that a student's choice of domain of study may be related to the level of naïveity of beliefs. Other work has been done on differences in beliefs across domains or major fields of study (Jehng et al., 1993; Kahn, 2000; Paulsen & Wells, 1998; Schommer &

Walker, 1995).

Grade Point Average. Students were asked at the time of the survey to predict their expected grade point average (GPA) for the semester. Of the 483 participants who responded to that item, the lowest expected GPA was .90 and the highest was 4.00. The average predicted GPA was 3.23. Paulsen and Wells (1998) found that GPA is related to beliefs.

Table 6

Descriptive Statistics for Reason Items by Factors

Factor Label/ Reason Item Number	Reason	Mean
Factor One: Keep Job		
Reason Item 7	I need to brush up on my skills in order to keep the job I have	1.45 (1.12)[a]
Reason Item 8	I need to brush up on my current skills in order to get promoted in my job	1.84 (1.64)
Reason Item 10	I need to learn new skills in order to keep the job I have	1.48 (1.18)

Table 6 con't

Factor Two: Employer		
Reason Item 4	My employer sent me to this course to learn a new skill or skills	1.35 (1.07)
Reason Item 5	My employer sent me to this course in order to brush up on skills I currently have	1.32 (1.00)
Factor Three: Find job		
Reason Item 6	I need to brush up on my skills in order to find a job	1.45 (1.93)
Reason Item 9	I need to learn new skills in order to find a job	3.47 (2.11)
Reason Item 11	I want to learn new skills in order to find a better paying job	4.65 (1.91)
Factor Four: Credential/Transfer		
Reason Item 1	I plan to earn a vocational or technical certificate	2.68 (2.00)
Reason Item 2	I plan to earn an associate degree	4.44 (1.94)
Reason Item 3	I plan to transfer to a four-year university or college	4.55 (1.84)

Table 6 con't

Factor Five: Personal growth		
Reason Item 12	Coming to this college has nothing to do with my job now or in the future or with earning a degree or transferring to a four-year university; I just enjoy going to classes and learning different things	2.24 (1.70)
Reason Item 13	I'm not sure what I want to do in the future and community college seemed like a good place to find out.	2.41 (1.92)

Note. [a] Numbers in parentheses are standard deviations for each item.

Of all of the reason items, reason item 11, which concerns learning skills in order to find a better paying job, has the highest average scale score of any other reason item at 4.65. This reason loaded onto Factor Three: Find job; the other reason items that loaded onto this factor were item 6 with a mean of 2.60 and item 9 with a mean of 3.47. Even the lowest mean of the reasons in this group at 2.60 seems to indicate that it is true of them that they are attending

community college in order to learn or enhance skills that will enable them to find a better paying job.

The reasons with the next highest averages are those concerning earning a credential or transferring to a four year university with reason item 2 at 4.44 and reason item 3 at 4.55. These reasons loaded onto Factor Four: Credential/Transfer. These averages appear to indicate that earning a credential either at the community college or later on at a four-year university is still a learning goal of the community college student.

Reason items 7 (mean of 1.45) and 8 (mean of 1.84) loaded onto Factor One: Keep job. The low means of the reason items would appear to indicate that the majority of community college students do not find it true of them that they are seeking education in order to stay in their present jobs.

Factor Two: Employer had reason items 4 and 5, which had the lowest of all means at 1.35 for item 4 and 1.32 for item 5. Very few students indicated that it was of true of them that their employers had sent them to college to learn or upgrade skills.

Reason items 12 (mean of 2.24) and 13 (mean of 2.41) loaded onto Factor Five: Personal growth. It appears that about half of the students surveyed felt that these reasons were true of them and half felt that these reasons were not true of them.

Multiple Regression Analysis

The method used for statistical analysis in this study was multiple

regression. It is the method by which other earlier research has been used to determine epistemological beliefs and their relationship to domains of study (Jehng et al., 1993; Kahn, 2000; Paulsen & Wells, 1998; Schommer & Walker, 1995), age (Paulsen & Wells, 1998; Schommer, 1998), gender (Paulsen & Wells, 1998; Schommer, 1993; Schommer & Walker, 1995), mother's education (Kahn, 2000), and educational attainment (Comerford et al., 2000; Jehng et al., 1993; Kahn, 2000).

Each dependent variable was put into the model and regressed onto the independent variables. In this study, each of the four dimensions of epistemological beliefs, fixed ability, simple knowledge, quick learning, and certain knowledge, is a dependent variable, and the independent variables include the background characteristics and five factors based on reasons for attendance.

Tables 7 through 10 show the regression models for each of the four dimensions of epistemological beliefs. The tables show the analysis of variance for each dependent variable, parameter estimates for the effect of each variable, as well as the t-value and p-value for each variable. Following each table is a discussion of the findings of that model.

Table 7

Dependent Variable: Fixed Ability

Analysis of Variance

Source	df	Sum of squares	Mean square	F value	Pr>F
Model	16	46.98	2.94	5.41	<0.0001
Error	492	267.19	0.54		
Total	508	314.18			

Independent variable	Parameter estimate	t-value	p-value
Age	-0.01804	-4.90	<.0001
Gender	-0.21481	-2.89	0.0040
African American	0.09014	0.91	0.3638
Asian American	0.18766	0.98	0.3276
Other ethnic group	0.09582	0.66	0.5076
Hispanic	0.37098	2.51	0.0124
Educational Attainment	0.11301	0.53	0.5959

Mother's education	0.00449	0.06	0.9488
GPA	-0.16403	-2.44	0.0149
Vocational major	-0.03323	-0.45	0.6564
Non-degree seeking	0.13904	1.11	0.2674
Factor1: Keep job	0.11241	3.39	0.0007
Factor2: Employer	0.03090	0.92	0.3557
Factor3: Find job	-0.04086	-1.18	0.2368
Factor4: Credential/transfer	0.03434	0.94	0.3497
Factor5: Personal growth	0.02195	0.62	0.5367

R-square= 0.1495 F-value= 5.41 p-value= <.0001

Fixed Ability

Based on an R-square of 0.15, and F-value of 5.41, and a p-value of <.05, it is clear Fixed Ability is related to multiple independent variables in the study. Community college students who are attending college in order to keep the jobs that they currently have or to enhance skills that would enable them to get promoted in those jobs were found to be more likely to be naïve than others in their beliefs about fixed ability. Factor 1: Keep job shows a positive association with naïve beliefs with a t-value of 3.39 and p-value of <0.05. Community college students attending for this reason tend to believe that the ability to learn is innate, that they are either born with this ability or they are not. Hispanic students, too, were found to be more naïve in their beliefs about fixed ability. This variable also

shows a positive association with naïve beliefs, with a t-value of 2.51 and a p-value of <0.05.

However, female students, older students, and those students who expected a higher GPA believe that they can improve their ability to learn. The gender variable shows a negative association with naïve beliefs with a t-value of –2.89 and a p-value of <0.05. On the other hand, male students, younger students, and those who expected a lower GPA tend to believe that the ability to learn is innate; they are either born with the ability to learn or they are not.

Age was the most significant indicator of naïve beliefs about fixed ability and had a negative association in naïve beliefs with a t-value of –4.90 and a p-value of <0.05. The older a student is the less likely he/she is to have naïve beliefs that the ability to learn is innate.

Students who expected a higher GPA also held less naïve beliefs about fixed ability, with a t-value of –2.44 and a p-value of <0.05. On the other hand, students who expected a lower GPA at the end of the semester tended to believe that the ability to learn is apparent at birth and it isn't likely to improve.

Table 8

Dependent Variable: Quick Learning

Analysis of Variance

Source	df	Sum of Squares	Mean Square	F value	Pr>F
Model	16	19.59	1.22	2.41	0.0017
Error	492	250.44	0.51		
Total	508	270.03			

Independent variable	Parameter estimate	t-value	p-value
Age	-0.00177	-0.50	0.6207
Gender	-0.14370	-2.00	0.0464
African American	0.09041	0.94	0.3468
Asian American	0.15023	0.81	0.4181
Other ethnic group	0.00554	0.04	0.9684
Hispanic	0.24347	1.70	0.0897
Educational Attainment	-0.21964	-1.07	0.2872
Mother's education	-0.01124	-0.17	0.8682
GPA	-0.06131	-0.94	0.3460

Vocational major	0.00165	0.02	0.9818
Non-degree seeking	0.06909	0.57	0.5690
Factor 1: Keep job	0.10348	3.23	0.0013
Factor 2: Employer	0.01773	0.55	0.5841
Factor 3: Find Job	-0.03699	-1.11	0.2685
Factor 4: Credential/transfer	-0.03457	-0.97	0.3307
Factor 5: Personal growth	0.08376	2.44	0.0152

R-square= 0.0726 F-value= 2.41 p-value= 0.0017

Quick Learning

The R-square of 0.07, F-value of 2.41, and p-value of <0.05 show that several of the variables in the study are related to the development of this epistemological belief. In particular, two of the five reason factors were statistically significant. Students who are attending community college in order to keep their jobs or get promoted in their jobs, or who are attending community college in order to discover their interests or grow personally were more naïve than others in their beliefs about quick learning. Factor 1: Keep job was the single most significant predictor of more naïve beliefs in quick learning with a t-value of 3.23 and a p-value of <0.05. Students attending for this reason believe that learning takes place quickly or not at all.

Students who are attending community college for personal growth, to explore opportunities, or because they just don't know what they want to do in the future are more likely than others to believe that learning happens fast or it

doesn't happen at all. Factor 5: Personal growth had a p-value of <0.05 and t-value of 2.44. These are indicators that students who were attending community college for discovery or exploratory reasons are more likely to be naïve in this epistemological belief.

Female students were likely to be less naïve in their beliefs about quick learning than were male students. This variable showed a negative association with quick learning, had a t-value of –2.00, and a p-value of <0.05. It too is a significant indicator of the level of sophistication in the epistemological belief about quick learning. Female students believe that learning does not take place quickly; rather, learning happens over a period of time. Male students, on the other hand, tend to believe that they either learn it the first time around or not at all.

Since this is an exploratory study, marginally significant findings are also reported for heuristic purposes. Hispanic students were found to be positively associated with quick learning at a p-value of <0.10 and t-value of 1.70. Students who are Hispanic may tend to be more naïve than students of other ethnic backgrounds in believing that learning happens quickly or it doesn't happen.

Table 9

Dependent Variable: Simple Knowledge

Analysis of Variance

Source	df	Sum of Squares	Mean Square	F value	Pr>F
Model	16	18.92	1.18	2.47	0.0012
Error	492	235.17	0.48		
Total	508	254.09			

Independent Variable	Parameter Estimate	t-value	p-value
Age	-0.00475	-1.38	0.1697
Gender	0.18811	2.70	0.0072
African American	-0.11306	-1.22	0.2248
Asian American	0.02479	0.14	0.8903
Other ethnic group	-0.34759	-2.56	0.0107
Hispanic	-0.19806	-1.43	0.1541
Educational attainment	-0.06017	-0.30	0.7634

Mother's Education	-0.01770	-0.27	0.7875
GPA	-0.13734	-2.18	0.0297
Vocational major	0.09083	1.30	0.1953
Non-degree seeking	0.10718	0.91	0.3621
Factor 1: Keep job	0.02381	0.77	0.4441
Factor 2: Employer	0.03497	1.12	0.2653
Factor 3: Find job	0.10354	3.20	0.0015
Factor 4: Credential/transfer	-0.03844	-1.12	0.2646
Factor 5: Personal growth	-0.02804	-0.84	0.403

R-square=0.0745 F-value=2.47 p-value=0.0012

Simple Knowledge

With an R-square of 0.07, F-value of 2.47, and a p-value of <0.05, it is apparent again that multiple variables contribute to the explanation of the variance of this epistemological belief. Students who were attending community college in order to find a job or a better paying job were significantly more likely than others to be naïve in their beliefs about simple knowledge. Factor 3: Find job was positively associated in this model with simple knowledge at a t-value of 3.20 and a p-value of <0.05, with this variable, out of all of those being tested, as the most significant indicator of beliefs about simple knowledge. Students attending community college in order to learn or enhance the skills that will enable them to find a job or a better paying job are much more likely than others to believe that knowledge is a collection of simple facts, unconnected to each

other.

Female students were found to be significantly more naïve, based on a positive association between this variable and the belief, a t-value of 2.70 and a p-value of <0.05. In this dimension of epistemological beliefs, women are more likely than men to believe that knowledge is unconnected to other knowledge. Students who expected higher grade point averages were less likely to believe that knowledge is a collection of simple facts, based on the negative association of this variable with this belief, a t-value of –2.18, and a p-value of <0.05.

Students who identified themselves in the ethnic group of "Other" and are non-Caucasian are less likely to believe that knowledge is a simple collection of unrelated facts, with a t-value of –2.56 and a p-value of <0.05. Students in this ethnic group are less likely than students from other ethnic groups to believe that knowledge is a simple collection of unrelated facts.

Table 10

Dependent Variable: Certain Knowledge

Analysis of Variance

Source	df	Sum of Squares	Mean Square	F value	Pr>F
Model	16	3.47	0.12	0.68	0.8126
Error	492	154.94	0.31		
Total	508	158.38			

Independent variable	Parameter Estimate	t-value	p-value
Age	-0.00452	-1.61	0.1078
Gender	0.07451	1.32	0.1886
African American	-0.04430	-0.59	0.5577
Asian American	0.05856	0.40	0.6881
Other	0.10177	0.92	0.3556
Hispanic	0.03498	0.31	0.7563
Educational Attainment	-0.19957	-1.23	0.2190
Mother's Education	-0.06035	-1.13	0.2579
GPA	0.02456	0.48	0.6312

Vocational majors	-0.02825	-0.50	0.6194
Non-degree seeking	-0.00257	-0.03	0.9785
Factor 1: Keep job	0.01442	0.57	0.5680
Factor 2: Employer	0.00118	0.05	0.9630
Factor 3: Find job	0.03369	1.28	0.2001
Factor 4: Credential/transfer	-0.01754	-0.63	0.5304
Factor 5: Personal growth	-0.01081	-0.40	0.6894

R-square=0.0217 F-value=0.68 p-value=0.8126

Certain Knowledge

With an R-square of 0.02, F-value of 0.68, and a p-value of 0.08, it is clear that there were no statistically significant findings in this study for this dimension of epistemological beliefs. None of the variables studied were significantly related at a .05 level or better to this belief. However, because this was an exploratory study, marginally significant findings are reported here for heuristic purposes. Age was found to be marginally significant with a negative relation to the belief that knowledge is unchanging and certain. This variable had a t-value of –1.61 and p-value of 0.11. Older students are less likely to hold naïve beliefs that knowledge is unchanging, while younger students are more likely to hold naïve beliefs that knowledge does not change and is certain. This finding is supported in earlier research on epistemological beliefs (Schommer, 1993, 1998; Paulsen & Wells, 1998).

Summary of Findings

Consistent with previous research, this study found that, as a whole, community college students are more or less sophisticated in their epistemological beliefs, depending upon their background characteristics. Additionally, reasons for attending college contribute in some fashion to epistemological beliefs of community college students. As a group, they tend to believe that knowledge is a simple series of unconnected facts, that learning is either quick or nonexistent, and that they are either born with the ability learn or they are not (Comerford et al., 2000; Schommer, 1993). Various background characteristics continue to be important in helping determine the way community college students view learning and knowledge. As with earlier studies, age, gender, and GPA continue to be important to their relation to students' beliefs. In contrast with previous research, domains of study and mother's education do not appear to be significant predictors of any dimensions of epistemological beliefs of community college students. In this particular study, the variable of mother's education shows no significance in any dimension, even at the marginal level.

Little earlier work has been done with ethnicity as a predictor of the four dimensions of epistemological beliefs as defined by Schommer. This study offers some initial findings that ethnicity may be somewhat related to epistemological beliefs. Persons identifying themselves as Hispanic showed a less naïve view of the belief that knowledge is a simple, unconnected collection of facts, and a more naive view of the belief that the ability to learn is innate and that it happens

quickly. Students who are in the "other" ethnic group are less likely to believe that knowledge is a simple collection of facts.

However, no work has been done previously in examining ways in which students' reasons for attending college predict their beliefs. This study shows, that of five key factors, there are three factors which can be used to explain and predict the way students in community colleges view learning and knowledge. Students who are attending community college in order to find a job, keep the job in which currently employed, or for personal growth and discovery of opportunity are more likely to bring naïve beliefs about knowledge and learning to the classroom. Chapter Five contains a discussion of the findings on each epistemological belief, as well as a discussion about the importance of each reason factor as a predictor of those beliefs. Implications and suggestions for future research, policy, and practice about these findings are discussed in the next chapter and a new lens through which to view community college students' epistemological beliefs is proposed, as well as additions to the current theories about epistemological beliefs.

CHAPTER FIVE

Overview

The purpose of this exploratory research was to develop a way to help community colleges assist their students in achieving success in their college experiences. It is well documented in the literature that community colleges fail their students when the measurement of success is completion of programs of study. Community college students rarely complete programs, certificates, or degrees. They stop out of college for extended periods of time, and wander in and out of college for years. When they do manage to complete a program or earn a degree, they have usually taken over five years to complete a "two-year" degree. By current popular and policy-driven definitions, few community college students are successful.

It is also documented in the literature that the more sophisticated or mature a student is in his/her epistemological beliefs, the more likely he/she is to be successful in academic endeavors. What previous research there has been on community college students and their beliefs has revealed that community college students are naïve in their epistemological beliefs across all four dimensions of those beliefs, which are fixed ability, quick learning, simple knowledge, and certain knowledge (Comerford et al., 2000; Garland, 1993;

Hofer, 1999; Paulsen & Feldman, 1999a, 1999b; Schommer, 1990). Previous research, though, has been limited to background characteristics and domains of study only and has not examined whether or not students' reasons for attendance—which are quite diverse among community college students—could be significant predictors of community college students' beliefs. If the epistemological beliefs of community college students are related to their diverse reasons for attendance, then community colleges can discover their particular students' beliefs in ways that are unobtrusive and not time-consuming for faculty or students, so that they could use that information to assist their students in achieving success in their learning goals. More particularly, faculty can help students become successful in the achievement of those learning goals that are related to their reasons for attending the community college.

Students in community colleges are more likely than those at four-year colleges and universities to be diverse in terms of many characteristics, such as their age, their ethnicity, the level of their parents' educational attainment, and their likelihood of working while attending college (AACC, 2000). Such diversity among students in the community college population understandably manifests itself in a diversity of reasons for attending the college as well as in diversity among students in the learning goals they plan to achieve. The student may be attending community college for training or retraining in an employable skill, to transfer to a four-year college or university, to earn a credential, or for personal enrichment through life-long learning.

Therefore, for purposes of this study, success for the community college student was reconceptutalized and redefined as the achievement of the learning goal related to the student's reason for attending. This chapter discusses the research findings presented in Chapter Four and offers suggestions for assisting the community college in findings ways to help the students achieve success when the student's reasons for attendance may or may not include earning a credential.

This resulting discussion is based upon the study of 509 students attending a local community college. The students' background characteristics very closely matched the national community college student background characteristics. The study used Schommer's Epistemological Questionnaire, a questionnaire regarding the students' reasons for attending community college, a survey of background characteristics, and student records.

This chapter will include a discussion of the findings from Chapter Four with some suggestions for practice for faculty, theoretical implications, suggestions for further research, and suggestions for policy and practice in community colleges.

In order to discuss the findings, the following research questions were posed and answered:

1. What are the student's epistemological beliefs?
2. What are the student's reasons for attending a community college?
3. Do these beliefs about knowledge and learning differ according to students'

reasons for attendance?

4. Do these beliefs about knowledge and learning differ according to selected demographic and background characteristics?

Summary of the Findings

For decades, researchers in the development of the college student have viewed students' development of epistemological beliefs as taking place along a uni-dimensional continuum. Nearly all previous research proposes that learners move through stages of learning, moving from one stage to another, though not necessarily in a fixed sequence. Schommer (1990) proposed that a better way to view personal epistemologies would be to look at them as a system of more-or-less independent beliefs, making the argument that a system of beliefs is multidimensional. In her argument, students may be sophisticated in one or more beliefs and naïve in others.

Recent research has also indicated that a student's beliefs about the nature of knowledge and learning are very important, but often overlooked, determinants of whether a student achieves his or her learning goals (Cornerford et al., 2000; Garland, 1993; Hofer, 1999; Paulsen & Feldman, 1999a, 1999b; Schommer, 1990).

This study first asked what the community college students' epistemological beliefs and reasons for attending community college were. Then the study looked how these reasons can predict what the students believe about knowledge and learning and how these beliefs may also be influenced by various

background characteristics. In order to understand the results, each belief will be briefly discussed individually with the factors and background characteristics that were found to be significant in the regression models.

Discussion on Findings on Epistemological Beliefs

Fixed Ability

Community college students' beliefs regarding fixed ability varied according to students' background characteristics and reasons for attendance. In reviewing the results, background characteristics appear to make a difference in the level of sophistication of beliefs, with women, older students, and those expecting a high GPA believing that learning can be improved and is not necessarily an innate ability. These are important findings, especially because a substantial number of community college students are women, and are of non-traditional age. These results are also consistent with previous research. For example, earlier studies have also found that being female and being older positively impacts the level of sophistication in most of the dimensions of beliefs. Earlier research has also shown that students' GPA's are predictors of the level of sophistication of beliefs.

Reasons for attendance also appear to impact this dimension of beliefs, with students who are attending community college in order to find employment or in order to find better paying employment appearing to be more naïve in this belief than are students attending for other reasons. It seems that students who are coming to the community college in order to learn or enhance skills that will

enable them to find jobs are more likely to believe that the ability to learn is fixed at birth and does not improve than are those who are coming to community college for other reasons. This finding is especially important because the three items that constitute Factor Three: Find job were among the highest-rated reasons for attendance in this study.

Simple Knowledge

Community college students' belief that knowledge is a collection of simple, unconnected facts vary significantly according to students' reasons for attendance and their background characteristics. In reviewing the results of the study regarding reasons for attendance, as with the dimension of fixed ability, students attending community college in order to learn or enhance the skills needed to find a job appeared to hold naïve beliefs in this dimension of beliefs. Again, this finding has special importance because ratings on items related to finding a job were among the highest rated items in this study; that is, attendance for reasons related to finding a job is very common and important for students in this study.

Other results on background characteristics showed that students who identified themselves ethnically as "Other" and students who expected to earn higher GPA's were found to be less naïve than were those who identified themselves as other ethnic groups and those who expected lower GPA's. Although much more research is needed, these findings suggest that non-Caucasian students tend to hold more sophisticated beliefs than Caucasians

regarding the complexity of knowledge.

Quick Learning

In this dimension of epistemological beliefs, two separate and distinct factors were discovered to be significant predictors of students' beliefs. Those factors were Factor One: Keep job and Factor Five: Personal growth/discovery. This was the only dimension of beliefs in which two factors were found to have statistical significance as predictors of epistemological beliefs. Students attending community college in order to keep their current jobs or for personal growth/ discovery reasons were found to be more naïve than others in the belief that one learns the first time around or doesn't learn at all. Even though average ratings on reason items related to these two factors were in the lower to moderate range, these reasons remain important for a substantial number of community college students.

However, in looking at background characteristics, women were found to be less naïve than men in this belief. This is consistent with what has been found in other studies and with other dimensions of beliefs (Schommer, 1993, 1998; Paulsen & Wells, 1998). Hispanic students were found to be more naïve than students from other ethnic groups in this dimension of beliefs.

Certain Knowledge

There were no significant findings (at the .05 level or better) in this study on this epistemological belief in community college students. However, the study found that age was marginally important as a predictor, with older students

believing that knowledge is not certain or true, that knowledge can change.

Community college students vary in their level of sophistication across all four dimensions of epistemological beliefs. Many of the findings in this study support previous research on various background characteristics, and are consistent with earlier studies on age and gender. In addition, the findings in this study suggest that students' reasons for attendance are significant to beliefs, when those reasons are job related (i.e. Factor One: Keep job and Factor Three: Find job) or when those reasons are related to personal growth and discovery of opportunity (i.e. Factor Five: Personal growth).

Discussion on Findings on Reasons for Attendance

Since this exploratory study was an attempt to discover if students' reasons for attendance could be predictors of their epistemological beliefs, it is important to understand the reasons for attendance that were used in the factor analysis and to have an understanding of how the students responded to that part of the survey instrument. Each factor with its corresponding reasons is described below.

Factor One: Keep job

The reason items that were found to load significantly onto this factor were items 7, 8, and 10. These items are: 7.) I need to brush up on my current skills in order to keep the job I have; 8). I need to brush up on my current skills in order to get promoted in my current job; and 10). I need to learn new skills in order to keep the job I have. This factor was found to be a significant predictor of two of

the four dimensions of epistemological beliefs: fixed ability and quick learning.

In both regression models, this factor was found to be positively associated with beliefs. If students were attending community college in order to keep their jobs and taking into account the various background characteristics, they were found to be more naïve than others in both fixed ability and quick learning beliefs.

However, these three reasons had very low means, indicating that many students said that these reasons were not as likely to be true of them. The mean of reason item 7 was 1.45; the mean of reason item 8 was 1.84, and the mean of reason item 10 was 1.48.

Factor Two: Employer

The reason items that loaded onto this factor were 4 and 5. These reasons are: 4). My employer sent me to this course to learn a new skill and 5). My employer sent me to this course to brush up on skills I currently have. The factor was not a significant predictor of any of the dimensions of epistemological beliefs. In addition, the averages for the two reason items were the lowest of all of the reasons at 1.35 for item 4 and 1.32 for item 5, showing that few students found this reason to be true of them.

Factor Three: Find job

This factor dealt with the reasons regarding finding initial employment or finding better employment. The reason items that loaded onto this factor were: 8). I need to brush up on my current skills in order to find a job: 9). I need to learn

new skills in order to find a job; and 11). I want to learn new skills in order to find a better paying job.

Factor Three: Find job was found, after testing for background characteristics, to be a significant predictor of the belief of simple knowledge. It is positively associated with simple knowledge in the regression model. Community college students attending for these reasons are likely to be more naïve than others in their belief that knowledge is a simple collection of unconnected facts.

The means for these reasons items were 2.60 for item 6, 3.47 for reason 9, and 4.65 for reason 11. These means suggest that a very large number of students found reasons related to finding jobs to be true of them. In fact, reason item 11 had the highest average of all the reason items, indicating that a large portion of the sample studied were there to learn new skills in order to find a better paying job. Therefore, the finding that students who attend for these reasons are more likely to hold naïve beliefs about simple knowledge should be a source of concern and a focus of special attention for community college faculty and staff.

Factor Four: Credential/Transfer

Reason items that loaded onto Factor Four: Credential/Transfer were items 1, 2, and 3. All of these reasons are concerned with earning a certificate or degree, either at the community college or at a four-year university. The reasons were: 1). I plan to earn a vocational or technical certificate: 2). I plan to earn an associate degree; or 3). I plan to transfer to a four-year college or university.

As with Factor Two: Employer, this particular factor was not found to be a significant predictor of any of the epistemological beliefs. An interesting finding was that the mean scores for these items, after item 11, were the highest of all the items, indicating that students' learning goals are still tied to the earning of a credential. The means were 2.68 for item 1, 4.44 for item 2, and 4.55 for item 3.

Factor Five: Personal Growth

Factor Five: Personal Growth was found to be a significant predictor of the belief in quick learning. The reason items that loaded onto this factor were 12 and 13. Item 12 is "Coming to community college has nothing to do with my job now or in the future or with earning a degree or with transferring to a four-year college or university; I just enjoy going to classes and learning new things." Item 13 is "I'm not sure what I want to do in the future and coming to community college seemed like a good place to find out." This factor was positively associated with quick learning in the regression model. Students attending for these reasons, after accounting for background characteristics, are likely to believe that learning takes place quickly or not at all.

The means for these items indicate that a moderate number of the students found these reasons for attendance to be true of them and therefore, this is a potential source of concern and focus of attention for community college faculty and staff. The mean for item 12 is 2.24 and for item 13 is 2.41.

In summary, the findings on the factors and corresponding reason items could be of special importance and concern to community colleges. Students

attending college in order to enhance employment skills, to discover opportunities, or for personal growth are more likely to hold naïve beliefs in simple knowledge, quick learning, and fixed ability than are students attending for other purposes.

Theoretical Implications

Very little research has been conducted to examine the epistemological beliefs of community college students, and none before this exploratory study to identify and study the variety of reasons for attendance among community college students. Furthermore, there have been virtually no systematic investigations of the possible relationships between the reasons for attendance and the epistemological beliefs of community college students. Therefore, an important implication of this study is the advancement of theory in the field of development of epistemological beliefs of community college students, with a corresponding addition to the definition of success of the community college experience to include completion of the student's learning goal based on their reason for attendance.

The existing model of epistemological beliefs has two major components: the epistemological beliefs themselves and background characteristics. These epistemological beliefs can be further broken down into the four dimensions of fixed ability, quick learning, simple knowledge, and certain knowledge, and the various background characteristics most often used in other studies include parental education, age, gender, ethnicity, academic performance, and

educational attainment. The current model is represented in Figure Two below:

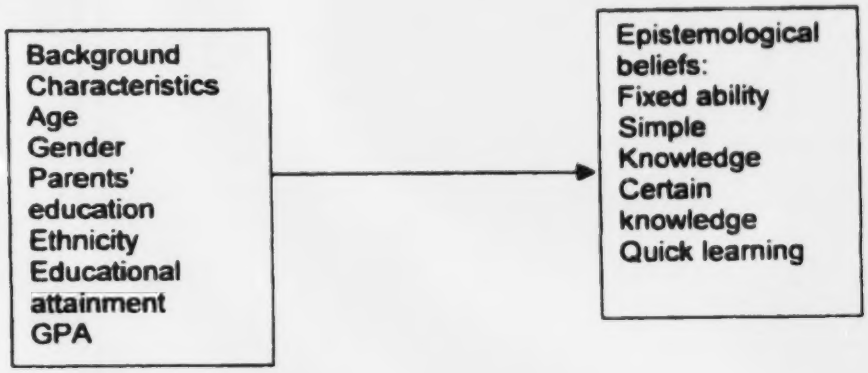

Figure 2: Current Model

Other research with domains of study and epistemological beliefs has added a third component to the model. A model showing the use of domains of study as an additional component could be viewed in Figure Three below:

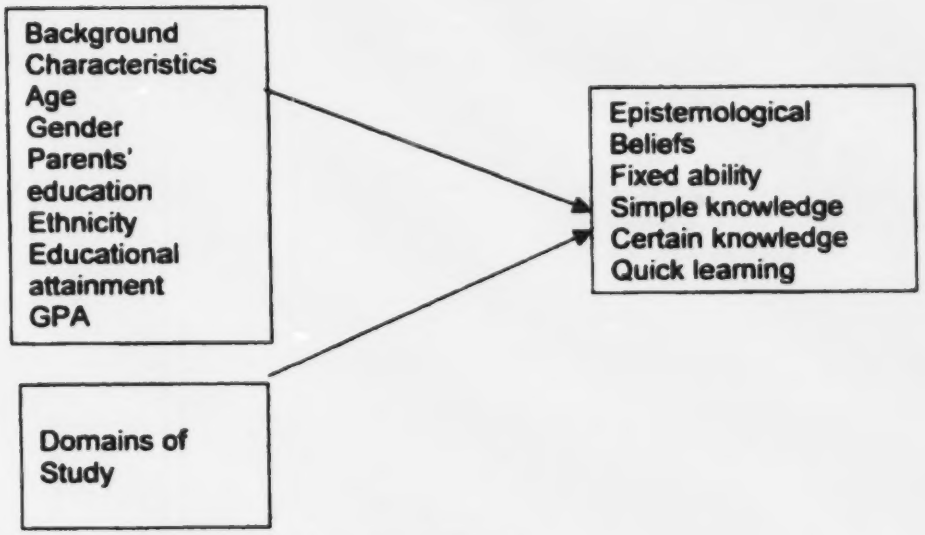

Figure 3: Model with Domains of Study

However, adding students' reasons for attendance as their learning goals makes a richer model, which includes explicit and implicit choices made by the student in their learning experiences. This new model of assessing students' epistemological beliefs introduces a set of constructs never before used to study the level of sophistication of epistemological beliefs and their impact on student success in achieving their learning goals. It may provide a foundation upon which to advance the understanding of how to help community college students have an academically successful educational experience. A representation of that model is presented in Figure Four below.

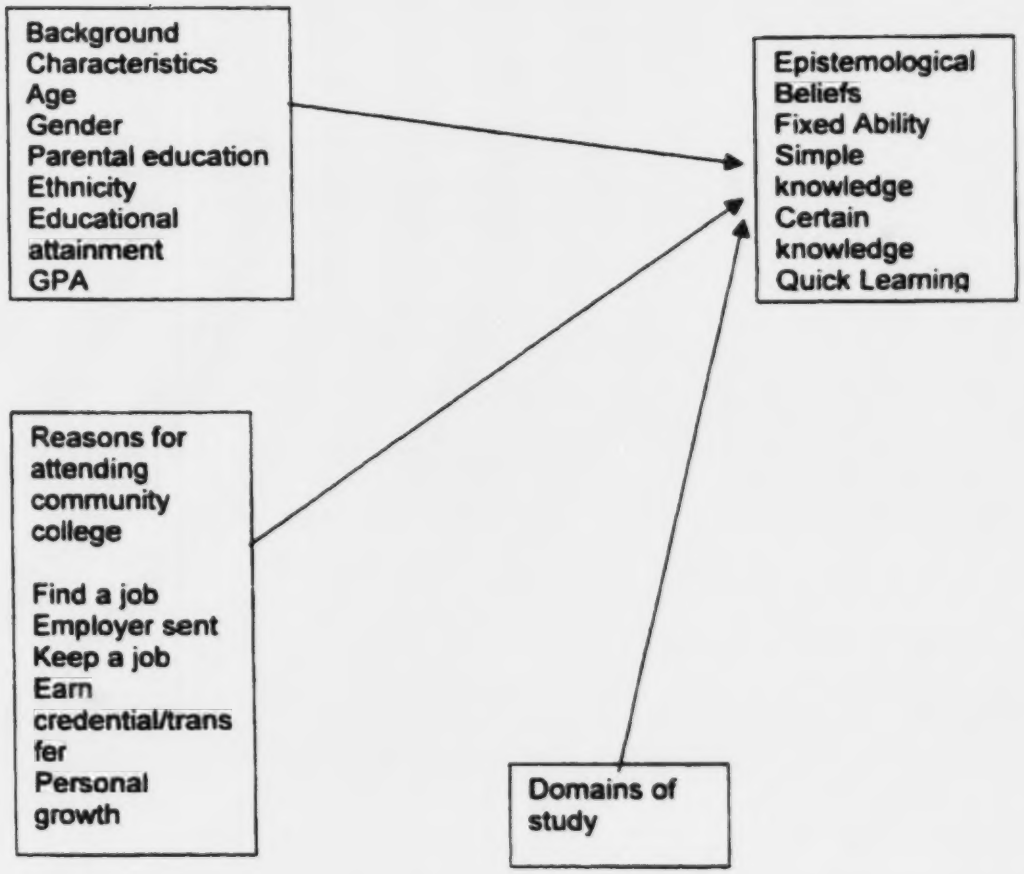

Figure 4: Model with Domains of Study and Reasons for Attendance

Figure Four portrays the model developed and tested in this study and provides an additional set of determinants of epistemological beliefs, and therefore, academic success in the community college. The results of the study from the factor analysis of the various potential reasons for attending community college and the regression models using background characteristics and reason

factors support the hypotheses for this study.

However, the definition of success as defined by the researcher may become somewhat problematic. Community colleges, in general, do not track students' success in terms of anything other than program completion or earning of a credential. There is often little follow-up done on departing students to determine if they feel that their goals have been achieved. Students are asked at their initial enrollment what their goals are in regards to transferring to a four-year institution or earning a credential, but seldom is there a choice about completing short-term learning goals. In order to implement this model and make changes on their own campuses, colleges will need to make decisions about how to find out if students feel like their learning goals have been met. In using this study to work with their students, it will no longer be appropriate to label students as non-completers (in other words, unsuccessful) simply because they do not earn a credential or transfer. If a student attends one course with the intention of upgrading skills and feels that at the end of this course he/she has achieved this goal, this student and the college have been successful.

Still, even with the potential problem of redefining success at the individual college campus, the "higher level of epistemological belief=student success" theory may now be more clearly defined because the new model provides some evidence that there are multiple identifiable and measurable contributing factors to epistemological beliefs themselves.

Suggestions for Practice for Faculty

Prior research shows that understanding students' epistemological beliefs is one way that faculty and administrators can help their students achieve their learning goals in their educational experiences. A simple question asked by the teacher during a "get acquainted session" or answered on a card completed by each student at the beginning of a semester to gain an understanding of the students' reasons for attendance may be appropriate. Since this study has shown that students who are attending community colleges in order to find a job, keep a job, or to decide what just what they want to do tend to hold more naïve beliefs in three out of the four epistemological beliefs, asking students why they are in the class would be an appropriate "get acquainted" question. The teacher could then use the responses to decide upon a course of action for modeling epistemic behaviors. Community college classes are usually smaller than those at larger four-year universities (AACC, 2000), which would allow for the extra amount of time to be devoted to such a discussion at the start of the class without a large sacrifice of class time. Once a teacher is aware of the probable level of sophistication of beliefs, he/she can model appropriate behaviors that will help students achieve a higher level of sophistication.

There is evidence to suggest that faculty influence students' epistemological beliefs, whether they are aware of it or not (Beers, 1988). By making a conscious effort to model their own epistemological beliefs, teachers of students who are less intellectually mature will help those students begin to

develop more sophisticated beliefs. Through their interactions with students, their assignments, and their organization of course content, teachers will demonstrate their more sophisticated assumptions about learning and knowledge (Beers, 1988).

By having a teacher who teaches in a way that encourages communication and the construction of knowledge on a personal level, students will begin to develop less naïve beliefs about the nature of knowledge and learning. Some specific teaching strategies may include activities such as the following:

1. Providing many opportunities for hands-on experience in classes such as science or technical courses. This practice allows students to generate knowledge and to construct their own learning experiences. It also offers students the opportunities to question authority through application of their own knowledge.
2. Presenting complex problems that do not have clear-cut answers and allowing and encouraging students to search for multiple solutions. Not only does this practice encourage students to question the certainty of knowledge, it also encourages students to take their time and realize that learning is not always quick. Searching for multiple solutions takes time and energy.
3. Teaching in a manner that shows connections between ideas and across disciplines and helping students see that their application of knowledge may change or need to be adjusted for specific situations by providing multiple

opportunities to apply knowledge. This practice helps students understand the connection between facts and encourages maturation in simple knowledge.

4. Showing a genuine respect for the students' learning and for their academic performance (Baxter Magolda, 1992; Beers, 1988; Schommer, 1994).

Previous studies have shown that students with more sophisticated beliefs often learn more effectively (Hofer, 1999; Schommer, 1990, 1993) and have motivational orientations and use learning strategies that have been shown to promote more effectiveness in the achievement of learning goals (Hofer, 1999; Paulsen & Feldman, 1999a, 1999b; Paulsen & Gentry, 1995; Pintrich, 1989).

Teachers have more influence on students' epistemological beliefs than they may be aware of, and using this influence to positively encourage epistemological growth is an awesome responsibility. Still, teachers do this routinely, aware or unaware. "Teachers who are aware of their own conceptions of knowledge and who monitor the articulation of those conceptions with the day-to-day activities of the classroom will stand the best chance of influencing students in a manner which is consistent with their primary educational objectives" (Beers, 1988, p. 92). By making an effort to understand their own beliefs, community college faculty will have greater success in helping their students mature and grow in their epistemological beliefs, resulting in greater educational achievement. Paying attention to such details as grading opportunities, wording in course syllabi, course objectives, and routinely discussing the epistemological basis for those things with the class can enhance

students' sophistication of beliefs.

Suggestions for Further Research

Current and on-going research in the development of dimensions of epistemological beliefs has included the study of the impact of various background variables (e.g., age, gender, parental education, and level of education) and domains of study on these beliefs. The empirical findings of this exploratory study suggest that students' reasons for attendance or learning goals also help predict their epistemological beliefs. By examining reasons along with various background characteristics and fields of study, a more complete understanding of college students' personal epistemologies will begin to emerge.

Even though the community college used in the study is very similar in demographic and background characteristics to other community colleges, other researchers may find it necessary to add or delete reasons that may be specific to the population that they are examining. For example, any study that seeks to discover if reasons for attendance impact university students' epistemological beliefs will probably want to eliminate the reason item that deals with transferring to a four-year university and may want to add a reason item that deals with continuing education at the graduate level, such as "I plan on attending graduate school after completion of my bachelor's degree."

It is not only important to understand that students with greater sophistication of beliefs achieve greater learning and understanding of knowledge, but it would also be informative to discover what, if any, changes in

beliefs occur during their community college experiences. Studies following students from the beginning of their community college careers through the completion of the student's learning goal would inform the theory. Using Schommer's Epistemological Questionnaire and the reason items developed for this study at the beginning of a student's career and then re-testing at the time the student indicates completion of the learning goal would be an interesting accompaniment to this initial exploratory study. This would be of particular interest to any community college which adopts a learning community philosophy.

There has not been enough work done yet with the influence of culture or family on epistemological beliefs. It would be of interest to find out how students from culturally diverse backgrounds perceive knowledge and learning. Some initial work has shown that students from shared-function groups, such as Asian American, Native Americans, and Hispanics, believe that learning occurs through a profound respect for the certain and absolute knowledge of the authority. Using the new model generated by the present study, which includes reasons for attending college along with various background characteristics, some interesting insights should appear that would enable those in community colleges to help these students achieve success in their academic endeavors.

Another avenue through which this discussion can continue is to look at student epistemologies and their persistence in colleges. Garland (1993) found that epistemic disconnect between teachers and students is one of many factors

that impede persistence. Students who feel that the epistemology of the course conflicts with their own beliefs or who feel that there is an epistemological gap between presented content and expectations of the course are less likely to persist. Further study on persistence, the influence on persistence by the students' beliefs, and helping students achieve their learning goals would be of great value to the community college, especially since the current definition of success is completion, which can only be gained through persistence.

Further study of the significance of programs of study as predictors of epistemological beliefs is warranted, especially in light of this new theory that may have importance to the issue of domains of study. Choices of learning goals may also impact students' domains of study, since the reasons for attending may inform the choice of programs of study. Students attending for reasons related to employment will often choose programs of study in the vocational and technical areas, whereas students whose primary goal is to transfer will most often choose a program of study in the academic or liberal arts areas.

Understanding students' epistemological beliefs, finding ways to uncover those beliefs when students aren't able to articulate them clearly, and using this information to help students meet their goals is the aim of this research. Finding ways to apply the new model will be important for community colleges.

Implications for Community Colleges

This study has several implications for community colleges. First, encouraging the inclusion of modeling more sophisticated teaching strategies

across the faculty is of primary importance. Allowing team teaching, block scheduling of courses, and offering interdisciplinary courses would let students see that knowledge is not a series of unconnected facts, but see instead that knowledge builds upon itself from one class to another.

Another approach would be to encourage service learning and internship opportunities for the students. Not only would the students discover that knowledge and learning is dynamic and evolving through hands-on experience in their given majors, but the community served would benefit as well.

A problem that is often encountered by college faculty is that, while they are experts in their fields, they may not have any formal training in classroom teaching. Beers (1988) found that few college teachers had had explicit training in pedagogical theories or techniques. Community colleges which offer workshops, seminars, and other opportunities that teach teachers how to teach would themselves be modeling a higher level of sophistication of epistemological beliefs.

In order to use the findings presented here, community college administrators will have to be willing to commit the additional time, effort, and resources needed to track students' educational learning goals and achievement of those goals. It will no longer be enough to label a student who departs as either a completer or a non-completer (or successful or unsuccessful), using this model. Students must be given the opportunity, either at enrollment or during some kind of forum, to state what their reasons for attending college are, and

they should be allowed multiple answers. Upon departure, such as graduation at the end of a program of study, withdrawal from the course, or non-returns the next semester, colleges should offer students the opportunity to state whether or not their goals have been met. If students state that the reasons for attendance have been successfully completed, then the learning goals have been successfully achieved. This could be done as simply as a phone survey or a survey completed by the student at departure.

Increasingly, on community college campuses, completion of programs of study is becoming less the expectation and more the exception. With welfare reform, many colleges are housing One-Stop Centers where job readiness skills, short-term training, and job placement services are offered with the community college serving as the training administrator. In addition, community colleges are finding that business and industry is demanding a different kind of delivery of courses for their employees and future employees, resulting in short-term, quick completion of single courses or series of courses.

Conclusion

Community colleges have always struggled with ways to help their students find success on their campuses. By allowing the student to decide just what the measurement of success should be by stating their reasons for attendance, and by using that information to gain an understanding of the students' epistemological beliefs, community colleges should stand a better chance of helping their students succeed.

The purpose of this survey study was to examine whether the epistemological beliefs of community college students -- that is their beliefs about the nature of knowledge and learning -- vary according to students' reasons for attendance while controlling for the effects on beliefs of other relevant background and educational characteristics of students. It is clear from this study that, while much still remains to be discovered about community college students and their beliefs, the reasons they attend college can be used to help the community college predict the level of sophistication of their beliefs. This knowledge can serve as one more tool that can be used by the community college to help their students achieve the learning goals they have selected for themselves.

REFERENCES

AACC (2000). National community college snapshot [online]. http://199.76.16/allaboutcc/snapshot.htm

AACC (2001). The community college impact [on-line]. http://www.aacc.nche.edu.

Alexander, P. & Judy, J. (1988). The interaction of domain-specific and strategic knowledge in academic performance. Review of Educational Research, 58 (4), 375-404.

Anderson, R. (1984). Some reflections of the acquisition of knowledge. Paper presented at annual meeting of the American Educational Research Association, New Orleans, LA., April 1984.

Bartel, A. & Lichtenberg, F. (1987). The comparative advantage of educated workers in implementing the new technology. The Review of Economics and Statistics,1, 1-11.

Bauer, K., Mitchell, R., & Bauer, P. (1991). Students' perceptions of selected academic and personal characteristics acquired at community colleges. College and University, 37 (1), 65-71.

Baxter Magolda, M. (1992). Students' epistemologies and academic experiences: Implications for pedagogy. The Review of Higher Education, 15 (3), 265-287.

Bean, J. P. & Metzner, B. S. (1985). A conceptual model of non-traditional

undergraduate student attrition. Review of Higher Education, 55 (4), 485-540.

Beckett, D. & Hager, P. (2000). Making judgments as the basis for workplace learning: Towards an epistemology of practice. International Journal of Lifelong Education, 19 (4), 300-311.

Beers, S. (1988). Epistemological assumptions and college teaching: Interactions in the college classroom. Journal of Research and Development in Education, 21 (4), 87-93.

Beeson, P. & Montgomery, E. (1993). The effects of college and universities on local labor markets. The Review of Economics and Statistics, 753-761.

Belenky, M., Clinchy, B., Goldberger, N. & Tarule, J. (1986). Women's ways of knowing. New York: Basic Books.

Berry, W. & Feldman, S. (1985). Multiple regression in practice. London: Sage Publications.

Bers, T. (1984). Confidence, commitment, and academic performance and retention of community college students. Paper presented at annual meeting of the Association for Institutional Research, Ft. Worth, Texas.

Boesel, D. & Fredland, E. (1999). College for all? Is there too much emphasis on getting a 4-year college degree? Washington, D.C.: U. S. Department of Education.

Cody, R. & Smith, J. (1997). Applied statistics and the SAS programming language. (4th ed). Upper Saddle River, NJ: Prentice Hall.

Comerford, S., Busk, P., & Roberts, W. (2000). Epistemological beliefs of community college students. Paper presented at American Educational Research Association, New Orleans, LA.

Cross, K. (1971). Beyond the open door: New students in higher education. San Francisco: Jossey-Bass Publishers.

Dougherty, K. J. (1987). The effects of community colleges: Aid or hindrance to socioeconomic attainment? Sociology of Education, 60, 86-103.

Dougherty, K. J. (1991). The community college at the crossroads: The need for structural reform. Harvard Educational Review, 61 (3), 311-336.

Duell, O. & Schommer-Aikins, M. (2001). Measures of people's beliefs about knowledge and learning. Educational Psychlogy Review, 13 , (4), in press.

Ely, E. (1997, April). The non-traditional student. Paper presented at the American Association of Community Colleges Annual Conference (77th). Anaheim, California.

Enman, M. & Lupart, J. (2000). Talented female students' resistance to science: An exploratory study of post-secondary achievement, motivation, persistence, and epistemological characteristics. High Ability Studies. Carfax Publishing Company.

Freeman, R. (1975). Overinvestment in college training. The Journal of Human Resources, 10 (3), 288-311.

Friedman, P. (1999). Post-secondary education options for low-income adults. Welfare Information Network Issue Notes, 3, (12).

Garland, M. (1993). Student perceptions of the situational, institutional, dispositional, and epistemological barriers to persistence. Distance Education, 14 (2), 181-198.

Grubb, W. N. (1989). The effects of differentiation on educational attainment: The case of community colleges. The Review of Higher Education, 12 (4), 349-374.

Grubb, W. N. (1995). Postsecondary education and the sub-baccalaureate labor market: Corrections and extensions. Economics of Education Review, 14 (3), 285-299.

Grubb, W. N. (1999). The economic benefit of sub-baccalaureate education: Results from national studies. CCRC Brief No. 2. Community College Research Center: Columbia University.

Grubb, W. N. (June/July 1992). Correcting conventional wisdom: Community college impact on students' jobs and salaries. AACJC Journal, 11-14.

Hair, J., Anderson, R., Tatham, R., & Black, W. (1998). Multivariate data analysis. (5th ed.). Upper Saddle River, NJ: Prentice Hall.

Harris, K. (1996). Life after welfare: Women, work, and repeat dependency. American Sociological Review, 61, 407-426.

Harris, T. (2001). Colleges diversify programs to meet students' need. Community College Times [on-line] http:// www.aacc.nche.edu.

Hativa, N. (1995). What is taught in an undergraduate lecture? Differences between a matched pair of pure and applied disciplines. New Directions for

Teaching and Learning, 64, 19-27.

Hofer, B. & Pintrich, P. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning. Review of Educational Research, 67 (1), 88-140.

Hofer, B. (1999). Instructional context in the college mathematics classroom: Epistemological beliefs and student motivation. Journal of Staff, Program & Organization Development, 16 (2), 73-82.

House, J. (1995). Noncognitive predictors of achievement in introductory college chemistry. Research in Higher Education, 36 (4), 473-491.

Jehng, J., Johnson, S. & Anderson, R. (1993). Schooling and students' epistemological beliefs about learning. Contemporary Educational Psychology, 18, 23-35.

Jenkins, D. & Fitzgerald, J. (1998). Community colleges: Connecting the poor to good jobs. Denver, CO: Education Commission of the States.

Johnston, R. & Usher, R. (1997). Re-theorising experience: Adult learning in contemporary social practices. Studies in the Education of Adults, 29 (2), 137-153.

Kahn, J. (2000). College students' epistemological beliefs: Differences by domain and educational level. Unpublished doctoral dissertation. New Orleans, LA: University of New Orleans.

Kane, T. & Rouse, C. (1995). Labor-market returns to two- and four-year colleges. The American Economic Review, 85 (3), 600-614.

Koltai, L. (1993). Community colleges: Making winners out of ordinary people. In A. Levin (ed). Higher Learning in America 1980-2000. Baltimore: Johns Hopkins University Press.

Kuhn, D. (1999). A development model of critical thinking. Educational Researcher, 28 (2), 16-26.

Leigh, D. & Gill, A. (1997). Labor market returns to community colleges: Evidence for returning adults. The Journal of Human Resources, 32 (2), 334-353.

Lerman, R., Riegg, S., & Salzman, H. (2000). The role of community colleges in expanding the supply of information technology workers. Washington, D.C.: The Urban Institute.

Lewis-Beck, M. (1980). Applied regression: An introduction. London: Sage Publications.

Metzner, B. S. & Bean, J. P. (1987) The estimation of a conceptual model of nontraditional undergraduate student attrition. Research in Higher Education, 27 (1), 15-38.

Monk-Turner, E. (1990). The occupational achievements of community and four-year college entrants. American Sociological Review, 55, 719-725.

Monk-Turner, E. (1994). Economic returns to community and four-year college education. Journal of Socio-Economics, 23 (4), 441-447.

Monk-Turner, E. (1998). Community college education and its impact on socioeconomic status attainment. Lewiston, N.Y.: The Edwin Mellen Press.

Mutter, P. (1992). Tinto's theory of departure and community college

student persistence. Journal of College Student Development, 33, 310-317.

National Center for Educational Statistics (2001). Mini-digest of education statistics. Washington, D.C.: U. S. Department of Education.

Nicholls, J., Cheung, P., Lauer, M., & Patashnick, M. (1989). Individual differences in academic motivation: Perceived ability, goals, beliefs, and values. Learning and Individual Differences, 1 (1), 63-84.

Nightingale, D., Trutko, J. & Barnow, B. (1999). The status of welfare-to-work grants programs after one year. Washington, D.C.: The Urban Institute.

Nora, A., Attinasi, L. C., & Matonak, A. (1990). Testing qualitative indicators of precollege factors in Tinto's attrition model: A community college student population. Review of Higher Education, 13 (3), 419-455.

Packer, M. & Goicoechea, J. (2000). Sociocultural and constructivist theories of learning: Ontology, not just epistemology. Educational Psychologist, 35 (4), 227-241.

Patrick, H., Ryan, A., & Pintrich, P. (1999). The differential impact of extrinsic and mastery goal orientations on males' and females' self-regulated learning. Learning and Individual Differences, 11 (2), 153-171.

Paulsen, M. & Feldman, K. (1999). Epistemological beliefs and self-regulated learning. Journal of Staff, Program, & Organization Development, 16 (2), 83-91.

Paulsen, M. & Feldman, K. (1999). Student motivation and epistemological beliefs. New Directions for Teaching and Learning, 78, 17-25.

Paulsen, M. & Gentry, J. (1995). Motivation, learning strategies, and academic performance: A study of the college finance classroom. Financial Practice in Education, 5 (1), 78-89.

Paulsen, M. & Wells, C. (1998). Domain differences in the epistemological beliefs of college students. Research in Higher Education, 39 (4), 365-384.

Paulsen, M. (1998). Recent research on the economics of attending college: Returns on investment and responsiveness. Research in Higher Education, 39 (4), 471-488.

Phillippe, K. A. & Patton, M. (2000). National Profile of Community Colleges: Trends & Statistics (3rd Edition), Community College Press, Washington, D.C.

Pintrich, P. & Johnson, G. (1990). Assessing and improving students' learning strategies. New Directions for Teaching and Learning, 42, 83-93.

Pintrich, P. (1995). Understanding self-regulated learning. New Directions for Teaching and Learning, 63, 3-13.

Pintrich, P. (1999). Taking control of research on volitional control: Challenges for future theory and research. Learning and Individual Differences, 11 (3), 335-354.

Pintrich, P. (2000). An achievement goal theory perspective on issues in motivation terminology, theory, and research. Contemporary Educational Psychology, 25, 92-104.

Pintrich, P. R. (1989). The dynamic interplay of student motivation and

cognition in the college classroom. In J. Maehr and C. Ames (eds.), Advances in motivation and achievement: Motivation enhancing environments. Volume 6. Greenwich, CT: JAI Press.

Presley, J., Clery, S, & Carroll, C. (2001). Middle income undergraduates: Where they enroll and how they pay for their education. Washington, D.C.: National Center for Education Statistics

Rentz, A. & Saddlemire, G. (1988). Student affairs functions in higher education. Springfield, IL: Charles C. Thomas Publisher.

Richardson, R. (1988). The presences of access and the pursuit of achievement. In J. Eaton (ed). College of Choice: The Enabling Impact of Community Colleges. New York: MacMillan.

Rossiter, M. (1999). A narrative approach to development: Implications for adult education. Adult Education Quarterly, 50 (1), 56-71.

Sanchez, J. & Laanen, F. (eds) (1998). Determining the economic benefits of attending community college. San Francisco: Jossey-Bass Publishers.

Sandy, L. (1998). The permeable classroom. Journal on Excellence in College Teaching, 9 (3), 47-63.

Schommer, M. & Walker, K. (1995). Are epistemological beliefs similar across domains? Journal of Educational Psychology, 87 (3), 424-432.

Schommer, M. & Walker, K. (1997). Epistemological beliefs and valuing school: Considerations for college admissions and retention. Research in Higher Education, 38 (2), 173-186.

Schommer, M. (1990). Effects of beliefs about the nature of knowledge on comprehension. Journal of Educational Psychology, 82 (3), 498-504.

Schommer, M. (1993). Comparisons of beliefs about the nature of knowledge and learning among postsecondary students. Research in Higher Education, 34 (3), 355-370.

Schommer, M. (1998). The influence of age and education on epistemological beliefs. British Journal of Educational Psychology, 68, 551-562.

Schommer, M. (1994). Synthesizing epistemological belief research: Tentative understandings and provocative confusions. Educational Psychology Review, 6 (4), 293-319.

Schwartz, S. (1990). Application of a conceptual model of college withdrawal of technical college students. Paper presented at the annual meeting of the American Educational Research Association, Boston, MA.

Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. Educational Researcher, 27 (3), 4-13.

Tinto, V. (1993). Leaving college: Rethinking the causes and cures of student attrition. Chicago: The University of Chicago Press.

Tinto, V. (1997). Classrooms as communities: Exploring the educational character of student persistence. Journal of Higher Education, 68 (6), 599-623.

Tsai, C. (2000). The effects of STS-oriented instruction on female tenth graders' cognitive structure outcomes and the role of student scientific epistemological beliefs. International Journal of Science Education, 22 (10),

1099-1115.

Vella, J. (2000). A spirited epistemology: Honoring the adult learner as subject. New Directions for Adult and Continuing Education, 35 , 7-16.

Wentzel, K. (2000). What is it I'm trying to achieve? Classroom goals from a content perspective. Contemporary Educational Psychology, 25, 105-115.

White, B. (2000). Pre-service teachers' epistemology viewed through perspectives on problematic classroom situations. Journal of Education for Teaching, 26 (3), 279-305.

APPENDIX

Consent Form

We would like to ask your participation in a study which is intended to find out how college students learn. As part of this study, we are asking you to fill out the attached questionnaire which asks about your beliefs about knowledge and learning. There are no right or wrong answers and this is not a test. Please respond to this questionnaire as accurately as possible, reflecting your own beliefs, attitudes, and behaviors. By learning how students learn, we hope to find ways to improve community college teaching.

Your participation is voluntary and you may withdraw consent and terminate participation at any time without consequence. Your participation is not related in any way to your grade in this class. The only risk associated with this study may be slight fatigue. If you wish to discuss this or any other discomforts you may experience, you may call me at 680-2408.

In addition, we would like to compare the results of this questionnaire with your college records. All responses are strictly confidential and only members of the research team will see your individual responses. No individual data will be shown or released in the report of this study.

Your signature and release of your social security number below indicates your consent for the research team to access this additional information.

If you have questions about the results of this study, you may contact the principal investigator, Carol McLeod, at 680-2408.

I have been fully informed of the above-described procedure with its possible benefits and risks and I have given permission of participation in the study.

Your printed name	Your signature
Today's date	Social Security Number

KNOWLEDGE AND LEARNING QUESTIONNAIRE

Directions: There are no right or wrong answers for the following questions. We want to know what you really believe. For each statement, circle your answer on the sheet for the degree to which you agree or disagree.

	Strongly disagree				Strongly agree
1. If you are ever going to understand something, it will make sense to you the first time you hear it.	1	2	3	4	5
2. The only thing that is certain is uncertainty itself.	1	2	3	4	5
3. For success in school, it's best not to ask too many questions.	1	2	3	4	5
4. A course in study skills would probably be valuable.	1	2	3	4	5
5. How much a person gets out of school mostly depends on the quality of the teacher.	1	2	3	4	5

6. You can believe almost everything you read. 1.....2.....3.....4.....5

7. I often wonder how much my teachers really know. 1.....2.....3.....4.....5

8. The ability to learn is innate. 1.....2.....3.....4.....5

9. It is annoying to listen to a lecturer who cannot seem to make up his mind as to what he really believes. 1.....2.....3.....4.....5

10. Successful students understand things quickly. 1.....2.....3.....4.....5

11. A good teacher's job is to keep his students from wandering from the right track. 1.....2.....3.....4.....5

12. If scientists try hard enough, they can find the truth to almost everything. 1.....2.....3.....4.....5

13. People who challenge authority are over-confident. 1.....2.....3.....4.....5

14. I try my best to combine information across chapters or even across classes. 1.....2.....3.....4.....5

15. The most successful students have discovered how to improve their ability to learn. 1.....2.....3.....4.....5

16. Things are simpler than most professors would have you believe. 1.....2.....3.....4.....5

17. The most important aspect of scientific work is precise measurement and careful work. 1.....2.....3.....4.....5

18. To me studying means getting the big ideas from the text, rather than details. 1.....2.....3.....4.....5

19. Educators should know by now which is the best method, lectures or small group discussions. 1.....2.....3.....4.....5

20. Going over and over a difficult textbook chapter usually won't help you understand it. 1.....2.....3.....4.....5

21. Scientists can ultimately get to the truth. 1.....2.....3.....4.....5

22. You never know what a book means unless you know the intent of the author. 1.....2.....3.....4.....5

23. The most important part of scientific work is

original thinking. 1.....2.....3.....4.....5

24. If I find the time to re-read a textbook chapter,
I get a lot more out of it the second time. 1.....2.....3.....4.....5

25. Students have a lot of control over how much they
get out of a textbook. 1.....2.....3.....4.....5

26. Genius is 10% ability and 90% hard work. 1.....2.....3.....4.....5

27. I find it refreshing to think about issues that authorities
can't agree on. 1.....2.....3.....4.....5

28. Everyone needs to learn how to learn. 1.....2.....3.....4.....5

29. When you first encounter a difficult concept in a textbook,
it's best to work it out on your own. 1.....2.....3.....4.....5

30. A sentence has little meaning unless you know the
situation in which it is spoken. 1.....2.....3.....4.....5

31. Being a good student generally involves memorizing facts. 1.....2.....3.....4.....5

32. Wisdom is not knowing the answers, but knowing how to find the answers. 1.....2.....3.....4.....5

33. Most words have one clear meaning. 1.....2.....3.....4.....5

34. Truth is unchanging. 1.....2.....3.....4.....5

35. If a person forgot details, and yet was able to come up with new ideas from a text, I would think they were bright. 1.....2.....3.....4.....5

36. Whenever I encounter a difficult problem in life, I consult my parents. 1.....2.....3.....4.....5

37. Learning definitions word-for-word is often necessary to do well on tests. 1.....2.....3.....4.....5

38. When I study, I look for specific facts. 1.....2.....3.....4.....5

39. If a person can't understand something within a short period of time, they should keep on trying. 1.....2.....3.....4.....5

40. Sometimes you just have to accept answers from a teacher even though you don't understand them. 1.....2.....3.....4.....5

41. If professors would stick more to the facts and less to theorizing, one could get more out of college. 1.....2.....3.....4.....5

42. I don't like movies that don't have an ending. 1.....2.....3.....4.....5

43. Getting ahead takes a lot of work. 1.....2.....3.....4.....5

44. It's a waste of time working on problems which have no possibility of coming out with a clear-cut and unambiguous answer. 1.....2.....3.....4.....5

45. You should evaluate the accuracy of information in a textbook , if you are familiar with the topic. 1.....2.....3.....4.....5

46. Often advice from experts should be questioned. 1.....2.....3.....4.....5

47. Some people are good learners, others are just stuck with limited ability. 1.....2.....3.....4.....5

48. Nothing is certain, but death and taxes. 1.....2.....3.....4.....5

49. The really smart students don't have to work hard to do well in school. 1.....2.....3.....4.....5

50. Working hard on a difficult problem for an extended period of time only pays off for really smart students. 1.....2.....3.....4.....5

51. If a person tries too hard to understand a problem, they will most likely just end up being confused. 1.....2.....3.....4.....5

52. Almost all the information you can learn from a textbook you will get during the first reading. 1.....2.....3.....4.....5

53. Usually you can figure out difficult concepts if you eliminate all outside distractions and really concentrate. 1.....2.....3.....4.....5

54. A really good way to understand a textbook is to reorganize the information according to your own personal scheme. 1.....2.....3.....4.....5

55. Students who are "average" in school will remain "average" for the rest of their lives. 1.....2.....3.....4.....5

56. A tidy mind is an empty mind. 1.....2.....3.....4.....5

57. An expert is someone who has a special gift in some area. 1.....2.....3.....4.....5

58. I really appreciate lecturers who organize their lectures 1.....2.....3.....4.....5
meticulously and then stick to their plan.

59. The best thing about science courses is that most 1.....2.....3.....4.....5
problems have only one right answer.

60. Learning is a slow process of building up knowledge. 1.....2.....3.....4.....5

61. Today's facts may be tomorrow's fiction. 1.....2.....3.....4.....5

62. Self-help books are not much help. 1.....2.....3.....4.....5

63. You will get confused if you try to integrate new ideas in a text book
with knowledge you already have about a topic. 1.....2.....3.....4.....5

REASONS FOR ATTENDING COMMUNITY COLLEGE QUESTIONNAIRE

Please circle your best answer to each reason for attending community college, with 1 as "This is not at all true of me" and 6 as "This is very true of me."

1. I plan to earn a vocational or technical certificate.

1.....2.....3.....4.....5.....6

2. I plan to earn an associates degree.

1.....2.....3.....4.....5.....6

3. I plan to transfer to a four-year college or university.

1.....2.....3.....4.....5.....6

4. My employer has sent me to this course to learn a new skill or skills.

1.....2.....3.....4.....5.....6

5. My employer has sent me to this course in order to brush up on skills I currently have.

1.....2.....3.....4.....5.....6

6. I need to brush up on my current skills in order to find a job.

1.....2.....3.....4.....5.....6

7. I need to brush up on my current skills in order to keep the job I currently have.

1.....2.....3.....4.....5.....6

8. I need to brush up on my current skills in order to get promoted in my job.

1.....2.....3.....4.....5.....6

BEST COPY AVAILABLE

9. I need to learn new skills in order to find a job.

1.....2.....3.....4.....5.....6

10. I need to learn new skills in order to keep the job I have.

1.....2.....3.....4.....5.....6

11. I want to learn new skills in order to find a better paying job.

1.....2.....3.....4.....5.....6

12. Coming to this college has nothing to do with my job now or in the future or with transferring to a four-year college or university or earning a degree: I just enjoy going to classes and learning different things.

1.....2.....3.....4.....5.....6

13. I'm not sure what I want to do in the future, and community college seemed like a good place to find out.

1.....2.....3.....4.....5.....6

DEMOGRAPHIC INFORMATION

Please answer each item.

1. Date of Birth (mm/dd/yy): ____/____/____

2. What is your gender (Please check) ____ Male _____Female

3. What is your ethnicity? ____ African-American

(Please Check only one) ____ Asian-American

____ Caucasion

____ Hispanic

____ Native American/Alaskan Native

____ Other: (fill in the blank)

_____

4. How many classes are you enrolled in for semester? (Please check only one)

____1 ____2 ____3 ____4 _____5 _____6

5. What is level of your secondary education? (Please check only one)

____ 1. I completed High School

_____2. I received my GED

_____3. I neither completed High School nor GED

6. What is your mother's level of education? As far as you know, please indicate the highest level of education achieved by your mother:

____ 8th grade or less

____ some high school

____ high school graduate

____some college

____ college graduate

____ some graduate work

____ graduate degree

____ professional degree

7. What is your father's level of education? As far as you know, please indicate the highest level of education achieved by your father.

____ 8th grade or less

____ some high school

____ high school graduate

____ some college

____ college graduate

____ some graduate work

____ graduate degree

____ professional degree

8. Have you ever been employed in a paid position or positions? (Please check only one) _____ Yes _____No

9. If you answered yes to #8, what is the **total number of years** that you have been

employed? Please fill in the blank with the **total** number of years that you have worked in paid job(s).

_____

10. What is the G.P.A. (on a 4-point scale) you expect to earn this semester?

_____

11. What is your major field of study? _____

THANK YOU FOR PARTICIPATING IN THIS STUDY.

VITA

Carol Brill McLeod graduated from the University of South Alabama, Mobile, Alabama in 1986 with a Bachelor's Degree in Secondary Education. She graduated in 1993 with a Master's Degree in Human Relations from the University of Oklahoma in Ramstein, Germany.

She has served as the Director of Human Resources at Nunez Community College in Chalmette, Louisiana since 1995. She was previously the Director of Financial Aid at Nunez Community College from 1993 to 1995, and was an instructor for Army Community Service's Program for the Military in Heidelberg, Germany from 1991 to 1993. From 1986 to 1991, she taught high school English, speech, theater, and forensics for Cumberland County Public Schools in Fayetteville, North Carolina.

DOCTORAL DISSERTATION REPORT

CANDIDATE: Carol B. McLeod

MAJOR FIELD: Educational Administration

TITLE OF DISSERTATION: Epistemological Differences Among Community College Students with Varying Reasons for Attendance

APPROVED:

Michael B. Paulsen

Major Professor & Chair
MICHAEL B. PAULSEN

Robert C. Carlson

Dean of the Graduate School

EXAMINING COMMITTEE:

Barbara J. Johnson

BARBARA J. JOHNSON

Amy E. Wells

AMY E. WELLS

Cecil James Killacky

CECIL JAMES KILLACKY

David Hollingsworth

DAVID HOLLINGSWORTH

DATE OF EXAMINATION:

April 11, 2002

310 206 8095

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: Epistemological differences among community colleges students with varying reasons for attendance.	
Author(s): Carol Brill McLead	
Corporate Source: University of New Orleans	Publication Date: May 2002

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents	The sample sticker shown below will be affixed to all Level 2A documents	The sample sticker shown below will be affixed to all Level 2B documents
PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY Sample TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) 1	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY Sample TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) 2A	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY Sample TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) 2B
Level 1 ☒	Level 2A ☐	Level 2B ☐
Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) and paper copy.	Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only	Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Signature: Carol B McLead	Printed Name/Position/Title: Carol B. McLead
Organization/Address: Nunez Community College 3710 Paris Rd, Chalmette, LA 70043	Telephone: 504 6802408 FAX: 504 680 2243 E-Mail Address: cmclead@nunez.edu Date: 9/17/03

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, *or*, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

ERIC®
Clearinghouse For
Community Colleges

University of California, Los Angeles
3051 Moore Hall
Box 951521
Los Angeles, CA 90095-1521

EE 45

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Processing and Reference Facility
4483-A Forbes Boulevard
Lanham, Maryland 20706

Telephone: 301-552-4200
Toll Free: 800-799-3742
FAX: 301-552-4700
e-mail: ericfac@inet.ed.gov
WWW: http://ericfac.piccard.csc.com

EFF-088 (Rev. 2/2000)